DOCUMENT RESUME

ED 266 275 CE 043 551

TITLE	Organize the Content for a CBE Program. Module K-2 of Category K--Implementing Competency-Based Education (CBE). Professional Teacher Education Module Series.
INSTITUTION	Ohio State Univ., Columbus. National Center for Research in Vocational Education.
SPONS AGENCY	Department of Education, Washington, DC.
REPORT NO	ISBN-0-89606-186-8
PUB DATE	86
NOTE	61p.; For related modules, see ED 262 204 and CE 043 552-555.
AVAILABLE FROM	American Association for Vocational Instructional Materials, 120 Driftmier Engineering Center, University of Georgia, Athens, GA 30602.
PUB TYPE	Guides - Classroom Use - Materials (For Learner) (051) -- Collected Works - Serials (022)
EDRS PRICE	MF01/PC03 Plus Postage.
DESCRIPTORS	Behavioral Objectives; Competence; *Competency Based Education; *Competency Based Teacher Education; *Course Content; Course Organization; *Curriculum Development; Educational Resources; Instructional Materials; *Job Analysis; *Learning Activities; Learning Modules; Material Development; Postsecondary Education; Program Development; Secondary Education; Task Analysis; Units of Study; Vocational Education

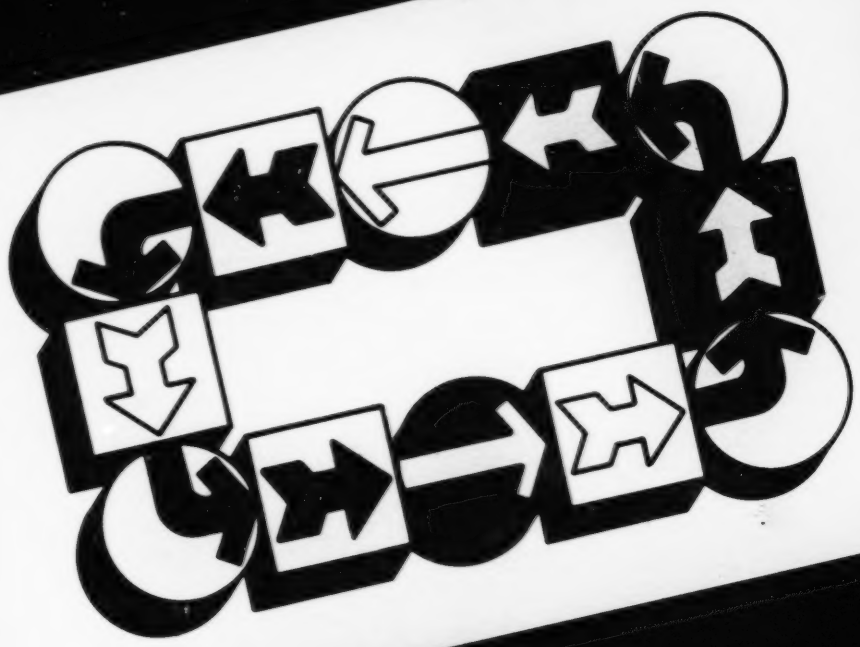
ABSTRACT

This module is one of a series of more than 125 performance-based teacher education (PBTE) learning packages focusing upon specific professional competencies of vocational instructors. The competencies upon which these modules are based were identified and verified through research as being important to successful occupational teaching at all levels of instruction. The modules are suitable for the preparation of instructors in all occupational areas. This module is designed to give prospective teachers skill in organizing the content for a competency-based program. The information and practice activities in the module will assist the student teacher in developing an occupational task list, verifying that list, and organizing it for instructional planning purposes. The module consists of a terminal objective, enabling objectives, prerequisites, resources and four learning experiences. The learning experiences, each based on an enabling objective, contain activities, information, case studies, feedback, and examples. The final learning experience is an actual teaching situation in which the prospective teacher is to organize the content for a competency-based education program and be assessed by a resource person. A sample assessment form is included. (KC)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

Organize the Content for a CBE Program

ED266275



AMERICAN ASSOCIATION FOR VOCATIONAL INSTRUCTIONAL MATERIALS
The University of Georgia
120 Driftmier Engineering Center / Athens GA 30602

THE NATIONAL CENTER FOR RESEARCH IN VOCATIONAL EDUCATION
THE OHIO STATE UNIVERSITY
1960 KENNY ROAD · COLUMBUS, OHIO 43210

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

This document has been reproduced as received from the person or organization originating it.

Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

FOREWORD

This module is one of a series of over 125 performance-based teacher education (PBTE) learning packages focusing upon specific professional competencies of occupational instructors (teachers, trainers). The competencies upon which these modules are based were identified and verified through research as being important to successful occupational teaching at all levels of instruction. The modules are suitable for the preparation of instructors in all occupational areas.

Each module provides learning experiences that integrate theory and application; each culminates with criterion-referenced assessment of the occupational instructor's performance of the specified competency. The materials are designed for use by teachers-in-training working individually or in groups under the direction and with the assistance of teacher educators or others acting as resource persons. Resource persons should be skilled in the teacher competencies being developed and should be thoroughly oriented to PBTE concepts and procedures before using these materials.

The design of the materials provides considerable flexibility for planning and conducting performance-based training programs for preservice and inservice teachers, as well as business-industry-labor trainers, to meet a wide variety of individual needs and interests. The materials are intended for use by local education programs, postsecondary institutions, state departments of education, universities and colleges, and others responsible for the professional development of occupational instructors.

The PBTE curriculum packages in Category K—Implementing Competency-Based Education (CBE)—are designed to enable occupational instructors to install and manage training programs embodying the principles and concepts of CBE. The modules are based upon 84 teacher competencies identified as essential to installing and managing competency-based occupational instructional programs.

Many individuals and institutions have contributed to the research, development, testing, and revision of these significant training materials. Appreciation is extended to the following individuals who, as members of the DACUM analysis panel, assisted National Center staff in the identification of the teacher competency statements upon which this category of modules is based: Odell Chism, Robert Dubanoski, Neil Reske, Bell Nicholson, Robert Rannells, Richard Sedlacek, William Shoaf, Kris Sitler, Michael Strohaber, and Ann Vescio. Appreciation is also extended to the following individuals for their critical reviews of the modules during the development process: Glen E. Fardig, Robert E. Norton, and Roger Harris.

Field testing of the materials was carried out with the assistance of field-site coordinators, teacher educators, students, directors of staff development, and others at the following institutions: DuPage Area Vocational Education Authority Center, Illinois; Indiana University of Pennsylvania; Pennsylvania State University; Seminole Community College, Florida; Trident Technical College, South Carolina; University of Arkansas, Fayetteville; University of Central Florida; University of Pittsburgh, Pennsylvania; University of Southern Maine; and University of Vermont .

Recognition for major individual roles in the development of these materials is extended to the following National Center staff: Lucille Campbell Thrane, Associate Director, Development Division, and James B. Hamilton, Program Director, for leadership and direction of the project; Michael E. Wonacott and C. Lynn Malowney, Program Associates, for module quality control; Cheryl M. Lowry, Research Specialist, and Billie Hooker, Graduate Research Associate, for developing illustration specifications; Barbara Shea for art work; Andonia Simandjuntak, Graduate Research Associate, for assistance in field-test data summarization; and Glen E. Fardig, Consultant, and Lois G. Harrington, Program Associate, for revision of the materials following field testing.

Special recognition is also extended to the staff at AAVIM for their invaluable contributions to the quality of the final printed products, particularly to Marilyn MacMillan for module layout, design, and final art work; and to George W. Smith, Jr. for supervision of the module production process.

Robert E. Taylor
Executive Director
The National Center for Research in Vocational Education

THE NATIONAL CENTER FOR RESEARCH IN VOCATIONAL EDUCATION
THE OHIO STATE UNIVERSITY
1960 KENNY ROAD · COLUMBUS, OHIO 43210

The National Center for Research in Vocational Education's mission is to increase the ability of diverse agencies, institutions, and organizations to solve educational problems relating to individual career planning, preparation, and progression. The National Center fulfills its mission by:

- Generating knowledge through research.
- Developing educational programs and products.
- Evaluating individual program needs and outcomes.
- Providing information for national planning and policy.
- Installing educational programs and products.
- Operating information systems and services.
- Conducting leadership development and training programs.

AAVIM
AMERICAN ASSOCIATION FOR VOCATIONAL INSTRUCTIONAL MATERIALS
The National Institute for Instructional Materials
120 Driftmier Engineering Center
Athens, Georgia 30602

The American Association for Vocational Instructional Materials (AAVIM) is a nonprofit national institute.

The institute is a cooperative effort of universities, colleges and divisions of vocational and technical education in the United States and Canada to provide for excellence in instructional materials.

Direction is given by a representative from each of the states, provinces and territories. AAVIM also works closely with teacher organizations, government agencies and industry.

MODULE

K-2

Organize the Content for a CBE Program

Module K-2 of Category K—Implementing Competency-Based Education (CBE)
PROFESSIONAL TEACHER EDUCATION MODULE SERIES

Glen E. Fardig, Consultant

The National Center for Research in Vocational Education
The Ohio State University

Key Program Staff:
James B. Hamilton, Program Director
Lois G. Harrington, Program Associate
Michael E. Wonacott, Program Associate
Glen E. Fardig, Consultant

Copyright © 1986 by The National Center for Research in Vocational Education, The Ohio State University, 1960 Kenny Road, Columbus, Ohio 43210.

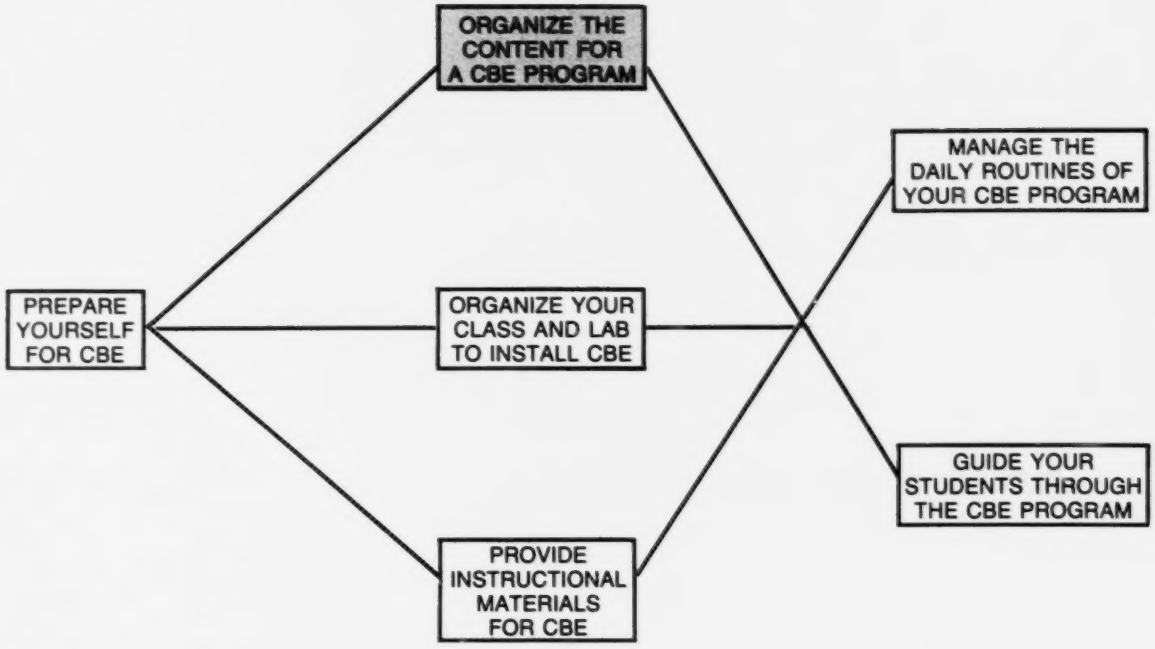
Copyright is claimed until full term. Thereafter all portions of this work covered by this copyright will be in the public domain.

This work was developed under a contract with the Department of Education. However, the content does not necessarily reflect the position or policy of that Agency, and no official endorsement of these materials should be inferred.

1986

ISBN 0-89606-186-8

Published and distributed by the **American Association for Vocational Instructional Materials (AAVIM)**, 120 Driftmier Engineering Center, The University of Georgia, Athens, Georgia 30602, (404) 542-2586.


ORGANIZE THE CONTENT FOR A CBE PROGRAM
MANAGE THE DAILY ROUTINES OF YOUR CBE PROGRAM
PREPARE YOURSELF FOR CBE
ORGANIZE YOUR CLASS AND LAB TO INSTALL CBE
GUIDE YOUR STUDENTS THROUGH THE CBE PROGRAM
PROVIDE INSTRUCTIONAL MATERIALS FOR CBE

CBE IMPLEMENTATION PROCESS

INTRODUCTION

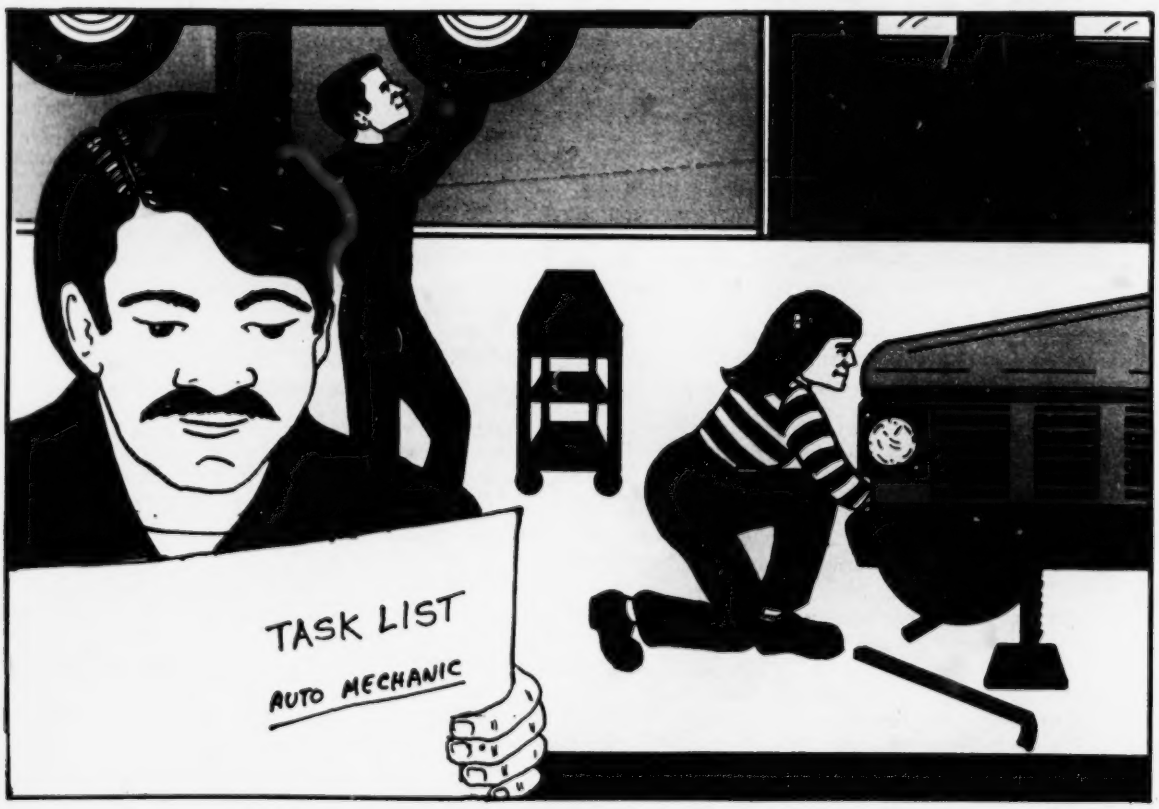
Vocational-technical instructors have always tried to teach their students the skills they will need on the job. In this respect, vocational-technical educators can feel a sense of genuine satisfaction about the way in which they have been able to define their teaching task clearly and efficiently. However, a demanding job market and a fast-changing technology can make it difficult to identify just what skills students need at any given time.

In a competency-based education (CBE) program, the competencies students are to achieve are defined with great care and precision. Competencies are spelled out so that they are clearly understood by the instructor who is to teach them, the student who is expected to learn them, and the employer who is going to hire the newly trained workers.

This early competency-identification stage of CBE program development is much like starting to button a coat. Unless you get that first button in the correct buttonhole, the job will never come out right. Unless you first carefully and rigorously identify the occupational competencies, the entire vocational-technical program may be botched.

This module is designed to give you skill in organizing the content for a CBE program, whether that program is in a secondary or postsecondary, public or proprietary institution. The information and practice activities in the module will assist you in developing an occupational task list, verifying that list, and organizing it for instructional planning purposes. (See the diagram on p. 2 to understand the relationship of this module to the other modules in Category K).

In producing a well-prepared competency (or task) list for an occupation, you are saying, in effect, "I now know what a person needs to be able to do as a beginning worker, and I am going to teach each of those competencies in a systematic way." When you can say that, you have done something important.



ABOUT THIS MODULE

Objectives

Terminal Objective: In an actual teaching situation, organize the content for a CBE program. Your performance will be assessed by your resource person, using the Teacher Performance Assessment Form, pp. 57–58 (*Learning Experience IV*).

Enabling Objectives:

1. After completing the required reading, (1) critique the performance of educators in given case studies in developing occupational task lists, and (2) evaluate the quality of a given series of task statements (*Learning Experience I*).
2. After completing the required reading, demonstrate knowledge of the procedures used in organizing an occupational task list for purposes of planning instruction (*Learning Experience II*).
3. After acquiring a task list for your occupational area, verify one duty area and organize the tasks for effective teaching and learning (*Learning Experience III*).

Prerequisites

The modules in Category K are **not** designed for the prospective teacher with no prior training and/or experience. They assume that you have achieved a minimal level of **content knowledge** in your occupational specialty and **skill** in the core teacher competencies of instructional planning, execution, and evaluation. They then build on or expand that knowledge and skill level, specifically in terms of implementing competency-based education.

Resources

A list of the outside resources that supplement those contained within the module follows. Check with your resource person (1) to determine the availability and the location of these resources, (2) to locate additional references in your occupational specialty, and (3) to get assistance in setting up activities with peers or observations of skilled teachers, if necessary. Your resource person may also be contacted if you have any difficulty with directions or in assessing your progress at any time.

Learning Experience I

Optional

Videotape: Nova Scotia Department of Education, "Performance-Based Training in Atlantic Canada." Charlottetown, Prince Edward Island, Canada: Holland College, Charlottetown Center, Clearinghouse, 1979.

Videotape equipment to use in viewing the videotaped presentation.

Reference: Norton, Robert E. *DACUM Coordinator's and Facilitator's Handbook.* Columbus, OH: The National Center for Research in Vocational Education, The Ohio State University, 1985.

A V-TECS catalog for your occupational area that you can review.

Learning Experience II

Optional

A vocational teacher in an operating CBE program whom you can interview concerning his/her approach to identifying occupational tasks and organizing them for instruction.

Learning Experience III

Required

A task list for your occupational area that you can partially verify and organize for instruction.

One or more incumbent workers in your occupational area who can verify the tasks in one duty area of your selected task list.

A resource person to evaluate your competency in verifying the tasks in one duty area of your selected task list and organizing them for instruction.

Learning Experience IV

Required

An actual teaching situation in which you can organize the content for a CBE program.

A resource person to assess your competency in organizing the content for a CBE program.

General Information

For information about the general organization of each performance-based teacher education (PBTE) module, general procedures for its use, and terminology that is common to all the modules, see About Using the National Center's PBTE Modules on the inside back cover. For more in-depth information on how to use the modules in teacher/trainer education programs, you may wish to refer to three related documents:

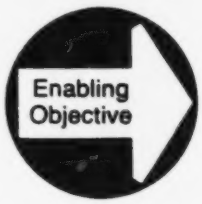
The *Student Guide to Using Performance-Based Teacher Education Materials* is designed to help orient preservice and inservice teachers and occupational trainers to PBTE in general and to the PBTE materials.

The *Resource Person Guide to Using Performance-Based Teacher Education Materials* can help prospective resource persons to guide and assist preservice and inservice teachers and occupational trainers in the development of professional teaching competencies through use of the PBTE modules. It also includes lists of all the module competencies, as well as a listing of the supplementary resources and the addresses where they can be obtained.

The *Guide to the Implementation of Performance-Based Teacher Education* is designed to help those who will administer the PBTE program. It contains answers to implementation questions, possible solutions to problems, and alternative courses of action.

Learning Experience I

OVERVIEW



After completing the required reading, (1) critique the performance of educators in given case studies in developing occupational task lists, and (2) evaluate the quality of a given series of task statements.

You will be reading the information sheet, Developing a Task List, pp. 7–27.

You may wish to view the videotape, "Performance-Based Training in Atlantic Canada," to learn how DACUM analysis is used to establish vocational program content. For more in-depth information on the DACUM process, you may wish to review the following supplementary reference: Norton, *DACUM Coordinator's and Facilitator's Handbook*.

You may wish to review a V-TECS catalog for your occupational area to determine how the catalog was developed and how it may be used as a basis for organizing content in a CBE program.

You will be reading the Case Studies, pp. 29–31, and critiquing the performance of the educators described.

You will be evaluating your competency in critiquing the educators' performance in developing occupational task lists by comparing your completed critiques with the Model Critiques, pp. 33–35.

You will be evaluating the quality of a series of task statements, using the Analysis Form, pp. 37–38, and rewriting those that need improvement.

You will be evaluating your competency in evaluating and rewriting task statements by comparing your completed Analysis Form with the Model Analysis, pp. 39–40.

Activity 1

As a first step in getting a competency-based education (CBE) program underway, an occupational task list must be prepared. Developing an occupational task list requires some careful planning and a lot of conscientious follow-through. Read this information sheet to find out how (and how not) to produce this crucial document for your program.

DEVELOPING A TASK LIST

Without a doubt, an occupational task list is the essential foundation on which a CBE program is built. The program's instructional materials may be slick. The management techniques may be smooth. The student evaluation procedures may be thorough. However, without a solid task list, the program may be weak and ineffective.

When a valid task list is developed, a vocational-technical program is well on its way in implementing CBE. Because identifying tasks requires careful thought, rigorous effort, and considerable resources, it is sometimes not given the attention and support it requires. However, you, as an instructor, can do much to ensure that your CBE program gets the resources needed and that a task list is developed that is worthy of building a program upon.

Right here we should try to clear up some potentially confusing terminology. In CBE, the terms *task*, *competency*, and *skill* may all be used to describe what workers are expected to do on the job—and what vocational-technical students are expected to learn in the instructional program.

Some people, however, make careful distinctions between these terms. For example, some use *task* to denote a unit of work done by a person in the particular occupation. Then, when an occupational task becomes part of an organized training program, they refer to it as a *competency*. Finally, they define a *skill* as a learned aptitude or ability used in performing a task.

These distinctions are justified. However, since the list of "tasks" identified by workers **becomes** the list of "competencies" to be achieved by students, trying to maintain those distinctions while explaining the process tends to become confusing. In a single paragraph, one ends up with too many terms describing the same thing and too many gray areas where either term might apply.

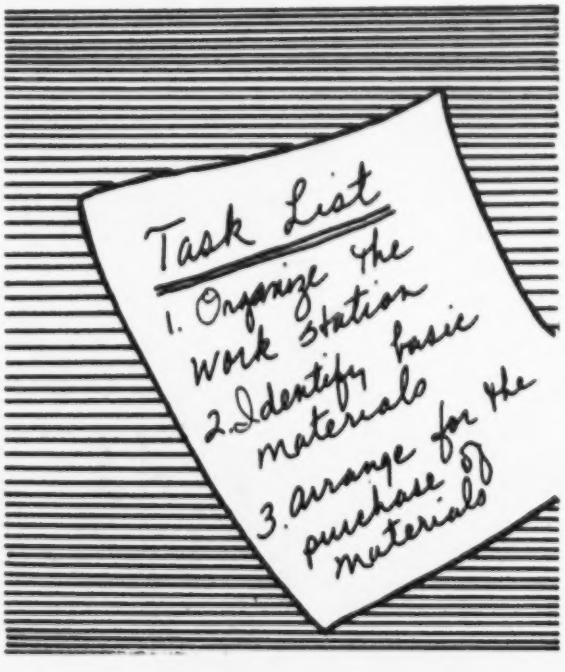
Thus, in this information sheet, which deals **primarily** with the identification of the tasks performed by workers in the occupation, we will, in general, use the term *task*. Then in Learning Experience II, which deals **primarily** with organizing the tasks for instructional purposes, we will, in general, use the term *competency*.

Types of Tasks to Be Identified

Of the five essential elements of CBE, the first is, "Competencies to be achieved are carefully identified, verified, and made public in advance of instruction." The first part of that element—careful identification of competencies—is generally accomplished using a process called **occupational analysis.**

In simple terms, an occupational analysis is a listing of all the tasks that make up a particular job and that are necessary for at least entry-level proficiency in a given occupation.

If, for example, students are to be prepared as computer programmers, you must first find out exactly what tasks a computer programmer performs on the job—what skills are needed to be a successful programmer. The same is true whether you are training physical therapists, upholsterers, or morticians. Only after you have carefully identified the specific tasks performed by workers in the occupation are you ready to plan your instructional program.



In constructing a task list, it is important to focus on what the worker actually does on the job—what he/she gets **paid for**. The worker gets paid for producing a product or providing a service, for example. These are activities that can be observed and evaluated.

Few people are paid for simply **knowing** something. The cook gets paid for preparing appetizing and nutritious dishes, not for knowing the problems of food preservation or the principles of human nutrition. The aircraft mechanic is on the payroll not for knowing Pascal's Law but for maintaining the hydraulic control system.

In this view then, there are no such things as "knowledge competencies." Knowledge is seen as an enabler—an essential element for performing a task in the proper manner, at the appropriate time, and under the right conditions.

Of course a cook must have knowledge of nutrition in order to select a balanced menu and prepare foods so as to retain their vitamin content. A horticulturist must know a good deal about plant diseases in order to apply the most effective herbicide to an affected ornamental.

Of course a knowledge base is required in order for a respiratory therapist to take a sample of arterial blood for analysis. It is absolutely essential that this person have knowledge of anatomy (to insert the needle accurately and painlessly), knowledge of asepsis (to prevent infection), and knowledge of physiology (to know when this procedure is called for).

What is true for knowledge is also true for attitudes. Workers don't get paid by their employers **just** for having certain attitudes. They succeed on the job first by being able to correctly perform the tasks required, and then by performing those tasks in the right style—treating customers fairly and pleasantly, avoiding waste of materials, using their time efficiently, looking for ways to improve the process or the products. These are **indicators** of attitudes that employers find important.

It is the actual observable skills that you must be concerned with in constructing a task list. These provide the **organizers** for training purposes.

Later in the process, you will need to analyze each task to determine the elements of knowledge and attitudes necessary to perform that task in the required way. Still later (and this is the difficult part), you will need to design instruction so that students will acquire the requisite knowledge and develop the desired attitudes just when these are most relevant and useful.

Task List Characteristics

If you include the wrong tasks in your instructional program, or omit essential occupational tasks, the foundation you provide for your CBE program will not be very sound. Therefore, as you develop the task list for your program, you should ensure that it has all the following qualities.

The list must be complete. Your task list should include **all** the tasks performed by entry-level workers in the specific occupation. The occupational analysis process should be so thorough that no important task is missed or given insufficient attention.

Nor should any tasks be removed from the identified list. The list should **not** be shaped to meet the limitations of available equipment, or the particular interests and skills of the instructor, or the likes and dislikes of the students.

A particular marine engine program, for example, may not have the equipment required to teach electronic ignition systems. But if that is a task entry-level workers must be able to perform, then the task list must include it. Any limitations or constraints in the instructional program can be dealt with later.

Furthermore, only **valid** tasks should be included in the list. CBE is a lean and efficient instructional system. You need to resist the tendency to add things that are "nice to know" or that you think might in some way "strengthen students' moral fiber."

Instructors often want to add topics to the list because they consider them to be important to students or because they have always required them. These teacher-developed "tasks" may be worthy things for students to do, but the task list is not the place for them. If a vocational-technical program has certain other expectations of students, a separate document explaining these should be furnished to students as they enter the program.

The task list must be up-to-date. No one is likely to openly disagree with that statement; nonetheless, it is often ignored or violated. This is a time when occupations and technical areas are in a state of flux. There are a number of emerging occupations that are changing rapidly, and even traditional occupations are employing new processes and new materials.

It is easy to continue to teach skills that are familiar and comfortable for the instructor, but that is not acceptable if those skills are no longer needed in the job market. Some occupations are moving so rapidly that the task list will need to be updated virtually

every year. For all others, it is vital that the task lists be reverified regularly and frequently to be sure that they remain relevant and valid.

The tasks should be locally verified. Even the best nationally produced occupational analyses may not be totally suitable for your local program. Students must be prepared for the job market they will enter. There is little point in including skills useful only in other, far-distant geographic areas. So, too, local practice and materials may dictate the inclusion of special skills needed in your region.

A rough carpenter working in Kentucky, for example, probably does not need some of the skills listed on an occupational task list developed in Florida. He or she may not need to be able to build structures capable of resisting hurricanes. On the other hand, he or she should know how to sharpen a froe and split shingles—tasks that may not have been included on the Florida list.

By locally verifying any occupational analyses obtained elsewhere, you can help ensure that your program will produce workers that employers in the community will want to hire.

The task list must be on target. This simply means that the occupational program must be clearly defined and its tasks must be identified in a rigorous manner. It is not adequate to identify tasks in "electronics," for example. The instructor must define the following:

- For **what specific occupations** in the field of electronics are students being trained (e.g., TV repair or miniature circuit design)?
- At **what level** will program graduates be working?
- In **what setting** will program graduates be working?

Only then will the instructor be able to clearly identify the discrete tasks that workers in the occupation perform. If these questions are not carefully answered, there may be much waste, inefficiency, and confusion in the program.

Typically, vocational-technical programs are designed to provide "entry-level" training. Entry-level means the skills needed to enter a new job—but this may be a job at any point on the career ladder, even a high position. It does not imply entering at the bottom rung of the occupation—although that may be the case. Your occupational advisory committee can be of great help in sharpening the definition of your program and keeping the task list on target.

Uses of a Task List in CBE

Obviously, the primary function of the verified task list is to serve as a basis for organizing instruction. Instruction needs to be provided for each of the competencies on the task list. Students need to be held accountable for achieving each competency. And students' performance of each competency needs to be evaluated. The task list, therefore, becomes the framework on which every element of the instructional program is built.

There are, however, a number of additional ways in which a task list can be used. They are mentioned briefly here and described in more detail elsewhere.

- The task list helps identify valuable learning experiences that could be provided outside the regular vocational-technical facilities (e.g., in field experiences, co-op programs, field trips, on-the-job training).
- The task list serves as a guide to the program. Through this list, prospective students can gain an accurate perspective of the occupation. Trainees can use the list to guide their activities and monitor their achievement. And instructors can use the list to record student progress in completing competencies.
- The task list informs people from business and industry of the content of the program in a way that is readily understandable. Thus, they can more easily provide input and assistance where needed.

- In perhaps an alternate form, the task list can become a student transcript—a detailed record of the student's achievement of each of the identified program competencies.
- Prospective employers can use the task list to evaluate an applicant's suitability for the job and to place hirees in appropriate positions.

Forms of Task Lists

What does a task list look like? How long is it? How is it written? Basically, a task list consists of a series of short, straightforward statements describing the tasks the worker must be able to perform on the job. It is not a course outline or a course of study, although it usually takes the place of these documents in curriculum development. Nor is it a narrative program description. The task list may take one of two forms:

- **List form**—A task list may be a simple listing of all the identified occupational tasks. Usually, in this form the task statements are grouped into duties (or duty areas or general areas of competence—GACs). These classifications are simply broad divisions of responsibility. They are convenient for organizing the tasks so that some are not inadvertently omitted and so that training can be systematized.

  People may disagree about where to place a specific task. For example, does the task *Evaluate staff performance* belong under the duty area of *Management* or *Professional Relations*? Placement of a specific task does not matter much as long as (1) the placement is logical and (2) each required task in fact appears on the list. A portion of a task list in list form is shown in sample 1.
- **Chart form**—Using a chart form, the tasks in a program are displayed graphically, usually organized into duties (or duty areas or general areas of competence—GACs). In one form of chart, the duties are arranged in a column on the left-hand side. A horizontal row or band then extends to the right of each duty, listing all the specific tasks included in that duty. A portion of a task list in chart form is shown in sample 2.

The chart form has much to recommend it. Students, as well as instructors, can comprehend the total program and its contents more readily. In either case, however, the tasks included can be entered into a computer, and the data bank thus created can be used for student record keeping and program evaluation purposes.

There is no established **length** for a task list. If you look at lists from other sources, you might find a list with as few as 15 statements and another with as many as 1,500. Both these extremes are probably well off the mark.

The very short list no doubt consists only of broad duty areas and, as such, would not be very useful as a basis for instruction or student evaluation. One of the powers of CBE is its clear specificity, and this would be lost if such a list were used.

The other kind of list, consisting of many hundreds or even thousands of task statements, borders on the bizarre. In no ordinary occupation are there that many skills for which training must be provided. Nor is there any reasonable way in which an instructor could assess every student's performance on each one. The developers of such lists are usually listing subskills and procedural steps instead of trainable skills.

Remarkably enough, existing occupational analyses indicate that the great majority of occupations encompass between 100 and 200 tasks. There are variations, of course, depending on whether the occupation is a very simple or highly complex one. But, in general, you should look twice at any task list much shorter or a great deal longer than this.

Incidentally, you will also find that tasks will organize themselves into from 8 to a maximum of 12 duty areas. A task list divided into a number of duties within this range proves to be very practical, and there seems to be little profit in dividing the tasks more extensively.

Students can achieve skill in 100–200 competencies in a resonable period of time. Learning guides or modules can be developed for each one. And instructors find that it is feasible to evaluate each student's performance on each competency.

SAMPLE 1

PARTIAL TASK LIST: LIST FORM

Bank Teller

Duty Area A: Planning and Organizing

A 01 Arrange coins in coin tray for day's transactions
A 02 Arrange for safekeeping of money at teller's window
A 03 Determine amount of cash required to transact business for the day
A 04 Determine that equipment (e.g., adding machine or calculator) is in working order
A 05 Determine that sufficient supplies are available for day's work
A 06 Maintain sufficient amount of cash at teller's window
A 07 Organize supplies (e.g., deposit slips, money straps) for day's transactions

Duty Area B: Supervising and Implementing

B 01 Conduct on-the-job training for new employees
B 02 Consult with auditor or bank examiner
B 03 Demonstrate equipment and procedures for other employees
B 04 Follow procedures for conduct during and after robbery
B 05 Greet customers
B 06 Plan teller's work schedules and breaks
B 07 Serve as notary public
B 08 Serve as vault attendant
B 09 Supervise clerks who help in recording, filing, and clearing
B 10 Audit books
B 11 Audit bank statements

Duty Area C: Inspecting and Evaluating

C 01 Examine checks for acceptability
C 02 Examine counter receipts for acceptability
C 03 Examine deposit tickets for acceptability
C 04 Inspect for accumulation of excess money at teller's window
C 05 Inspect for counterfeit money
C 06 Inspect for mutilated and badly worn coin
C 07 Inspect for mutilated and badly worn currency
C 08 Verify customer's identification
C 09 Verify customer's passbook

SOURCE: "Occupational Inventory for Bank Teller," Catalog of Performance Guides (Atlanta, GA: Southern Association of Colleges and Schools, Commission on Occupational Education Institutions, Vocational-Technical Education Consortium of States, n.d.).

SAMPLE 2

PARTIAL TASK LIST: CHART FORM

Drafting Skill Profile

Duties	Tasks				
A Conduct Field Work and Make Preliminary Presentations	A-1 Take Measurements	A-2 Determine Site Orientation	A-3 Make Site Inspections of Work Being Done	A-4 Use Surveying Techniques	A-5 Develop Working Sketches
B Prepare Final Drawings	B-1 Determine Type and Size of Medium	B-2 Prepare Surface for Drawing (Pounce)	B-3 Determine Details to Be Shown (Isometric, Auxiliary)	B-4 Lay out Drawings	B-5 Apply Basic Principles and Practices Pertaining to Drafting Specialty
Prepare Final Drawings (cont'd)	B-14 Make Assembly Drawings (Isometric)	B-15 Make Perspective Drawings	B-16 Make Tracings	B-17 Check Drawings for Completeness and Accuracy	
C Communicate With Others	C-1 Consult With Peers	C-2 Consult With Clients	C-3 Consult With Craftspersons and Technicians	C-4 Communicate With Supervising Personnel	C-5 Communicate With Subcontractors and Vendors
D Use Reference Materials	D-1 Use French's and Svenson's References	D-2 Use Architectural Graphics Standards	D-3 Use Sweet's Catalog	D-4 Follow Company Standards	D-5 Conduct Library Research
E Make Mathematical Calculations	E-1 Convert Inches to Metrics	E-2 Convert Fractions to Decimals	E-3 Make Geometric Calculations	E-4 Make Trigonometric Calculations	E-5 Apply Basic Principles of Physics
F Prepare Written Documents	F-1 Develop Written Instructions or Specifications	F-2 Generate Job Orders or Worksheets	F-3 Write Change Orders	F-4 Submit Requisitions for Services	F-5 Submit Requisitions for Drafting Supplies
G Check Drawings	G-1 Check Accuracy of Dimensions and Scale	G-2 Check Coordination of Prints	G-3 Check Revisions	G-4 Check for Completeness	G-5 Check Line Quality
H Reproduce Drawings	H-1 Select Type of Reproduction	H-2 Make Copies of Drawings	H-3 Make Copies of Blueprints	H-4 Make Reproductions of Blueprints	H-5 Make Photographic Reproductions
I Maintain Document Storage	I-1 File Masters	I-2 File Media Materials	I-3 Retrieve Media and Masters	I-4 Maintain File of Revisions	I-5 Maintain Drawing Log (Notebook or Index File)
J Continue Education	J-1 Participate in Inservice Education Classes and Seminars	J-2 Study Trade Publications	J-3 Participate in Trade Societies	J-4 Study Job-Related Books	J-5 Participate in Trade Shows and Exhibits

SOURCE: Adapted from a DACUM analysis done by Durham Technical Institute, Durham, North Carolina.

Your Role in Developing a Task List

It is difficult to generalize about how deeply you might be involved in the process of developing a task list. This will vary substantially from one training program to another.

In some few situations, you may be furnished with the completed task list or chart, perhaps one developed under the leadership of the curriculum development staff of the institution or one received from an outside source and verified locally. This is the exception, and it does have the disadvantage that, though the job may be well done, you may not have a sense of personal involvement or "ownership."

More likely, you will be involved in producing the task list in cooperation with others. You might help select the occupational analysis committee. You might search for outside sources of task lists. Or you might conduct the final local verification process.

It may be that you are one of that small band who must bear major (or even sole) responsibility for overseeing the development of the task list for your program. This could happen if you are working in a small school or system or in a rural setting. It might also be the case if you are an innovator—perhaps the first one in your institution who realizes the potential of the CBE approach and is willing to do the pioneering work necessary to install a fully functioning competency-based program.

Regardless of your role, you must know something of the methods and procedures for developing a task list—if for no other reason than to make sure that the one used in your CBE program has been constructed with rigorous care. You need to understand the characteristics, advantages, and disadvantages of occupational analysis procedures. In that way, you can help make the important decisions that will ultimately affect the effectiveness of your CBE program in a crucial way.

How NOT to Construct a Task List

The job of constructing a task list is not a casual one to be done during teacher planning periods or over a few cups of coffee. There are a number of methods for selecting curriculum content—such as the following—that simply are not adequate for a respectable CBE program. They do not meet the first principle of CBE that "competencies must be carefully identified."

The introspection method. This method consists of thinking of all the skills you used when you were active in the occupation. The obvious limitations of memory and personal experience and the rate of technological change make this method extremely weak—though very relaxing.

The textbook method. To use this method, you refer to a standard textbook and then translate the topic headings into task statements by adding action verbs. Here you are putting your trust in the textbook writer.

However, the textbook writer is writing for a national audience, not your program. The textbook content may be out of date (remember, it has taken even the latest textbook about three years to go through the writing/publishing process). And the writer probably has not him/herself done a scientific analysis of the occupation.

In short, the textbook method is not a defensible way to identify your program competencies. Changing topic statements in an existing course outline into task statements is equally poor.

The instructor-group method. At first glance, getting a group of teachers to come together and construct a task list appears to have merit. After all, drawing on the experience and knowledge of several teachers would seem to be superior to relying on the views of only one teacher. And, it might appear that the give-and-take of discussion could lead to the development of some good task statements.

However, there are serious deficiencies in this method. First, the teachers are probably no longer incumbent workers. Changes have undoubtedly occurred in the occupation, and the teachers no longer have firsthand experience.

Second, as instructors, their teaching interests, skills, and concerns color their perceptions of what should be taught. They cannot be as objective and disinterested in analyzing the occupation as they should be.

Finally, such committees are seldom sufficiently structured in their functioning to do the job with the thoroughness it requires.

The literature-search method. It is possible for you to search your university library, find a study describing the competencies needed in your occupational program, copy the results, and accept it as is. Surely this method cannot be completely bad?

However, unless you know in detail how the task list was developed (often not explained in reports), you may be accepting someone else's errors or fuzzy thinking. Then, too, such a task list does not have the immediacy you need. It may not be up-to-date, it is not truly yours, and it has not been verified for your community.

The advisory-group method. The occupational advisory committee for your program can indeed be of great assistance to you in the development and

refinement of your task list. However, unless the analysis task is organized and handled properly, advisory committee involvement will not yield the desired results.

Probably the poorest use of the advisory committee would be for you to gather your committee together, hand an existing list to them, and ask, "What do you think?" Surely you will get a lot of discussion, perhaps a spate of argument, and maybe some worthwhile suggestions for improvement—but not the penetrating analysis you need.

Neither should you simply hand over to the group the entire responsibility for task identification; that is expecting too much. After all, the members are workers, supervisors, or employers. They may not be trained in group dynamics or analysis procedures, and they may not be the representative group of expert workers/supervisors required.

If you have a well-chosen advisory committee, you may find their best contribution to be in (1) locally verifying an occupational analysis produced by another method or (2) helping you analyze each task to determine—for instructional purposes—the knowledge, skills, and attitudes required in performing it.

If the methods described are **not** acceptable ways for developing an occupational task list, what approach should you take? In fact, a variety of methods are available to you.

Developing the Initial Task List

You don't need to start from scratch in looking for a way to identify occupational tasks and construct your task list. There are accepted methods you can apply; you aren't required to invent new ones.

Use of Existing Sources

A number of agencies have spent a great deal of time and resources in the area of occupational analysis, and you can tap the results of this work for your own use. It would be unwise and inefficient to fail to use whatever has already been done. Just remember, existing analyses must be reviewed and verified locally before you can use them as a basis for instruction in your program.

Whether you are independently responsible or a member of a CBE implementation team, you can assist in locating the needed occupational analyses. To locate appropriate existing analyses, you need to be familiar with potential sources such as the following.

Resources in Vocational Education (RIVE). RIVE is produced by the ERIC Clearinghouse on Adult, Career, and Vocational Education at The Ohio State University in Columbus, Ohio. This is a bimonthly publication that provides indexes to, and summaries of, a variety of instructional and research materials.

Here you will find descriptions of recently developed occupational analyses, some of which may be helpful to you in constructing your task list. You can check local, university, or state department libraries or your institution's professional materials center for copies of RIVE.

State curriculum laboratories. Most states have curriculum laboratories or instructional materials centers, and these may well have occupational analyses you can use. Some states have separate labs for each of the occupational service areas; most, however, have one lab or center serving all areas. You will need to investigate the situation in your particular locality.

As examples of the kinds of help you may be able to get, Ohio State University's Trade & Industrial Instructional Materials Laboratory has published analyses for over 100 occupations. Colorado State University's Curriculum Materials Service has produced over 30 analyses, all of which can be purchased.

A number of states (e.g., Kentucky and Oklahoma) and local school systems (e.g., Orange County, Florida) have organized a centralized approach to the development of competency-based curricula and materials. They conduct occupational analyses and design standard curricula for the vocational programs under their jurisdiction.

Some individual institutions (e.g., Durham Technical Institute, North Carolina; Seminole Community College, Sanford, Florida) also develop occupational analyses for their own programs. Some of these institutions are willing to share their task lists with others.

Therefore, before you go off on your own, check with your local, regional, and state curriculum development offices to find out what efforts are already being made in this area. In addition, it is a good idea to subscribe to a CBE newsletter such as

Open Entries (published by The Center for Studies in Vocational Education; Florida State University; Stone Building; Tallahassee, FL 32306). *Open Entries* often contains information about available task lists and curricular materials for CBE.

Regional and national consortiums. There are now a number of regional and national consortiums that have been organized to develop occupational analyses and curriculum materials. These are funded by groups of states or institutions, and their products are usually available to vocational-technical instructors. The following are some examples of such consortiums:

- **Interstate Distributive Education Curriculum Consortium (IDECC)**—IDECC is a consortium of states that was organized in 1972 for the purpose of developing a competency-based learning system based on occupational analyses for 69 occupations in marketing and distribution. The consortium has sponsored the development of 500 learning activity packages (LAPs), containing 983 competencies and over 2,000 behavioral objectives. More LAPs are being developed based on occupational analyses for additional occupations.

  The IDECC office is located at The Ohio State University; 1564 West First Avenue; Columbus, OH 43212.
- **Mid-America Vocational Curriculum Consortium (MAVCC)**—This consortium of 11 states produces vocational instructional materials in a wide range of occupational areas. A task list, derived from an occupational analysis, forms the basis for the student instructional materials.

  These materials are available to member and nonmember states from Mid-America Vocational Curriculum Consortium, Inc.; 1500 West Seventh Avenue; Stillwater, OK 74074.
- **Vocational-Technical Education Consortium of States (V-TECS)**—V-TECS is a large and active organization, and its products are directly usable in developing CBE programs in many occupations. V-TECS is a consortium of states and U.S. Armed Services, joined together to conduct occupational analyses and publish them in the form of catalogs.

  A catalog for an occupation is organized into duty areas and task statements. Each task statement is accompanied by a performance guide and a criterion-referenced measure of student performance. Sample 3 shows a typical page from a V-TECS catalog.

  Each member state produces two catalogs during each 450-day period. These catalogs are then provided to all member states for local verification and dissemination. As of this writing, there are over 140 catalogs completed or under development.

  If your state is a member of V-TECS, you can obtain a list of all available catalogs, as well as copies of the specific catalogs you need, from the office of vocational education in your state department of education. Nonmember states can purchase individual copies at a nominal price from V-TECS; Curriculum Publications Clearinghouse; Western Illinois University; 46 Horrabin Hall; Macomb, IL 61455.
- **The National Network for Curriculum Coordination in Vocational and Technical Education (NNCCVTE)**—NNCCVTE, which includes six regional curriculum coordination centers (see sample 4), operates under the support of the U.S. Department of Education. These centers maintain libraries of curricular materials, including occupational analyses. They also have reference documents that can help you locate materials available elsewhere.

  If you identify a need for a specific occupational analysis, you (or your supervisor) can contact your NNCCVTE state representative in the state department and describe that need. He/she will contact your regional center, which would then contact the other five centers. Staff at each of the six centers would conduct searches to identify all related materials. Your center would provide you with this information and, in addition, can handle the ordering, shipping, and receiving of the materials for you.

SAMPLE 3

V-TECS CATALOG PAGE

DUTY: Cleaning Fabric Surfaces
TASK: VACUUM AND REMOVE SPOTS FROM UPHOLSTERED FURNITURE

Performance Objective 31

Given upholstered furniture and the necessary cleaning supplies and equipment, vacuum and remove all spots from the furniture.†

Criterion-Referenced Measure

The instructor will provide upholstered furniture and the necessary cleaning supplies and equipment. Vacuum and remove all spots from the furniture.

Performance Guide

1. Examine furniture for types of spots to be removed.
2. Assemble absorbent clean cloths, soft brush, vacuum cleaner, commercial upholstery cleaner, and toothpicks if pile of fabric is looped.
3. Remove dry particles of spots by gently brushing or scraping.
4. Vacuum furniture by using upholstery-dusting attachment.
5. Read and follow directions for using cleaner.
   CAUTION: Some cleaners may be flammable.
6. Test cleaner in an inconspicuous place on furniture for colorfastness of fabric.
7. Apply cleaner to spots.
8. Blot cleaner gently into fabric. Do not rub.
   NOTE: If cleaner is a solvent, work from center of spot outward, absorbing solvent immediately and repeating this procedure for each spot until all spots are removed. If fabric has looped pile, lift each loop with toothpick while fabric is damp.
9. Let fabric dry.
10. Gently brush treated spots.
11. Store cleaning supplies and equipment.

† Source of Standard for Performance Objective: Louisiana Catalog Writing Team *and* Laas, William, ed. *Good Housekeeping's Guide for Young Homemakers.* New York, New York: Harper and Row Publishers, 1966, pp. 325 & 338–339.

SOURCE: Thelma H. Leonard et al., *General House Worker* (Tallahassee, FL: Florida Career Education Center, 1979).

SAMPLE 4

NNCCVTE REGIONAL CENTERS

East Central Network for Curriculum Coordination

Areas served: Delaware, District of Columbia, Illinois, Indiana, Maryland, Michigan, Minnesota, Ohio, Pennsylvania, Virginia, West Virginia, Wisconsin

Director, East Central Network
Sangamon State University, E-22
Springfield, IL 62708
Toll-free in Illinois (800) 252-8533,
or (217) 786-6375

Midwest Curriculum Coordination Center

Areas served: Arkansas, Iowa, Kansas, Louisiana, Missouri, Nebraska, New Mexico, Oklahoma, Texas

State Department of Vocational and Technical Education
1515 West Sixth Avenue
Stillwater, OK 74074
(405) 377-2000, ext. 261

Northeast Curriculum Coordination Center

Areas served: Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Puerto Rico, Rhode Island, Vermont, Virgin Islands

Rutgers University
200 Old Matawan Road
Old Bridge, NJ 08857
(201) 390–1191

Northwestern Vocational Curriculum Management Center

Areas served: Alaska, Colorado, Idaho, Montana, North Dakota, Oregon, South Dakota, Utah, Washington, Wyoming

Saint Martin's College
Old Main Building, Room 474
Lacey, WA 98503
(206) 438–4456

Southeastern Curriculum Coordination Center

Areas served: Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee

Mississippi State University
Research and Curriculum Unit
Drawer DX
Mississippi State, MS 39762
(601) 325-2510

Western Curriculum Coordination Center

Areas served: American Samoa, Arizona, California, Guam, Hawaii, Nevada, Trust Territories of the Pacific Islands

University of Hawaii
College of Education
1776 University Avenue
Honolulu, HI 96822
(808) 948-7834

There are other sources you should also investigate. In your own state, certain occupational analyses may have been developed by a particular institution or agency (e.g., a school district, university, professional or technical association, labor organization, business corporation, federal or state government bureau, trade association, or research firm).

It might take some work to identify these efforts, but if you find what you are looking for, it could save you a lot of work. Certainly in popular fields such as electronics technician or nurse's aide, you should have no trouble in locating a recent analysis somewhere.

After all your best efforts, you may determine that an occupational analysis does not exist for your program. (And if you are teaching one of the more esoteric occupations, such as casino dealer or solar heater installer, this is a definite possibility). In that case, an occupational analysis will need to be undertaken.[1]

As an instructor, you should not expect to do this yourself. Your institution may be able to arrange to have an analysis completed by the state department of education staff or the vocational staff of a local university. The institution could, as another alternative, arrange to share the development costs and responsibilities with other local education agencies.

The DACUM Approach

There is one occupational analysis system that you definitely should know about because of its remarkable success and its close association with the CBE movement. This system has a number of characteristics that are greatly needed if CBE is to be a **practical** alternative to conventional vocational-technical programming.

- It is a very speedy process, taking only a few days to complete (though the effort is intense).
- As occupational analyses go, it is certainly inexpensive.
- The final result—a task list for the occupation in chart form—can be favorably compared in validity with any other method; and in sheer usefulness, it surpasses just about all of them.

This occupational analysis system is called DACUM (say "day come"), and indeed, it is becoming an important approach to vocational-technical curriculum development. The name, incidentally, is simply an acronym concocted from the phrase "**D**eveloping **a** **C**urricu**l**u**m**."

DACUM was developed jointly by the Experimental Projects Branch of the Canada Department of Regional Economic Expansion and the General Learning Corporation of New York, which was providing technical direction to a Job Corps program in Clinton, Iowa.

The approach was tested in action-research training projects by Nova Scotia NewStart, Inc. (Yarmouth, Nova Scotia) and later implemented at Holland College (Charlottetown, Prince Edward Island). The process was discovered at Holland College by staff at the National Center for Research in Vocational Education and imported back into the U.S.

Originally designed strictly for occupational training programs, it has since proven to be equally effective for analyzing professional and semiprofessional fields. At present, DACUM is used in many areas of the country and has been adopted with particular success in community colleges.

The DACUM approach is based on three very simple and straightforward assumptions:

- Expert workers are better able to describe and define their occupation than anyone else.
- Any job can be effectively and sufficiently described in terms of the tasks performed by successful workers in the occupation.
- All tasks carry a component of knowledge and attitudes that workers must have in order to perform the tasks correctly.

If you can accept these assumptions, the process is as clear and logical as a multiplication table.

In brief, a DACUM analysis involves convening a small committee of workers from an occupation for a two- or three-day intensive workshop. A **trained DACUM coordinator** guides the group through the process of identifying the tasks that a worker in the field needs to be able to perform on the job.

At the completion of the work, the committee has produced a chart showing (1) the duties in the occupation and (2) the specific tasks involved in each area. Without further modification, the chart can be used to construct the instructional program—with instructional materials (e.g., learning packages) and performance checklists being developed for each task on the chart.

The DACUM committee. The quality of the final chart depends to a great extent on the careful choice of the DACUM committee members, who number from a minimum of 5 to a maximum of 10 or 12. These people are selected from the ranks of incumbent workers in the occupation or direct supervisors of workers. In other words, the committee members

1. To gain skill in developing a task list using conventional occupational analysis techniques, you may wish to refer to Module A-7, *Conduct an Occupational Analysis*.

are people who are on the job every day. They are **not** personnel directors or college teachers or textbook writers.

Of course the members must be experienced, up-to-date, and knowledgeable individuals. In addition, however, the DACUM process requires that members of the committee be articulate and able to work in a group setting.

The cost of a DACUM analysis is low, because committee members (or their employers) generally donate their time for however many days it takes.

There is one DACUM rule that makes some vocational-technical teachers uneasy: the instructors whose occupational area is being analyzed are not permitted to serve on the DACUM committee. This is done to prevent an instructor from wittingly or unwittingly (1) influencing the group in accordance with his/her own interests and skills or (2) making the chart reflect the instructional resources available.

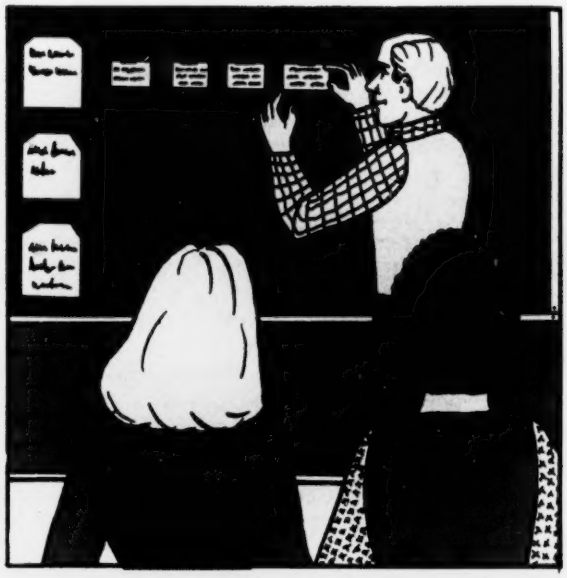
The DACUM coordinator. It looks simple, but the role of the DACUM coordinator is in fact a demanding one. The DACUM coordinator's task is to guide the group through the analysis—orienting them to the process, drawing out ideas, questioning each proposed task statement, gaining consensus from the group on each item, and keeping the discussion on target and the process on schedule.

The coordinator does not have to be an expert in the occupation being analyzed; in fact, it is better if he/she does not know too much about the subject area. However, he/she must be well trained in the DACUM system itself and have great skill in group dynamics.

The analysis process. The DACUM committee is grouped at tables facing a large blank wall. Following the committee's orientation, its first major task is to identify the eight or ten broad categories of tasks in the occupation, called duties, duty areas, or general areas of competence (GACs).

As each duty is agreed upon, it is written on a card. For example, in drafting, two duties might be *Conduct Field Work* and *Develop Preliminary Studies and Presentations*. The duty cards are then fastened to the wall along the left-hand side, forming a vertical column.

After the duties have been listed, the committee grapples with the job of identifying all the tasks (or skills or competencies) included in each duty. From drafting again, the tasks involved in conducting field work might include *Take measurements, Determine site orientation,* and *Use surveying techniques.* Note that each task statement starts with an action verb (i.e., *take, determine, use*), includes an object, and describes a substantial task.



There is a great deal of committee discussion as each task is proposed by a member, and ultimately, consensus is reached. Any task statement that survives the discussion process is printed on a small card and fastened to the wall in a horizontal band to the right of the appropriate duty card.

The initial analysis is judged complete when the committee has exhausted its collective knowledge. Finally, all statements are again examined, the wording is refined where necessary, and the cards are placed in an approximate instructional sequence.

Typically, the analysis process takes two to three solid days. However, some simple occupations may be analyzed in a single day, and some complex technical areas may take up to four days to analyze. When the committee leaves (exhausted), the chart on the wall is complete. No one—instructor or administrator—is permitted to make any substantive changes in it. The chart becomes the official basis for program development and instruction.

DACUM curriculum development. The production of the DACUM chart is, of course, not the end of the curriculum development process. It is just the beginning. For some occupational areas, the chart is further analyzed, and profiles of suboccupations are outlined on it. In other words, the specific tasks required by each suboccupation are marked in some way, so that students know exactly what they need to accomplish to enter each suboccupation.

Each task on the chart (whether there are 75 or 275) then serves as a basis for the development of instruction. This may include devising learning activities, obtaining necessary equipment and supplies, and selecting instructional resources.

In addition, a resource-file box is often set up for each task. In each box are placed all the supporting print and media materials related to the task. A learning package designed to help students use all this material in an organized way may also be written for each task. Thus, every task statement on the chart becomes the basis for a discrete segment of instruction.

This is a time-consuming process that is best done by a development team consisting of the instructor, a writer, a media specialist, and a secretary. Sample 5 shows a program development grid used by one institution to help organize the process. The grid shows each step that must be taken to plan instruction for each task on the DACUM chart.

What the instructor can (and cannot) do. There are several ways in which you, as an instructor, may contribute to the DACUM process. First, you can (perhaps with assistance from your occupational advisory committee) clearly define the occupation that is to be analyzed. Second, you will surely help in the all-important selection of members for the DACUM committee. After all, you undoubtedly have contacts in the field and know some good prospects for committee members.

Third, although instructors are not permitted to serve on the committee, you are encouraged to sit in and listen, taking notes of the discussion so that the chart will have more meaning for you later. Last, you should certainly be a part of the development team when the DACUM chart is used to devise learning activities, produce media, and organize the instructional program.

A word of warning is in order here. As you read this description of the DACUM process, you may be saying to yourself, "That's a pretty good idea. I think I'll use it." And you may be tempted to go right ahead and set up a DACUM committee—with you serving as coordinator—for analyzing the occupational programs in your institution.

However, if you attempt to conduct DACUM analyses without the training, observation, and experience it requires, three results can be predicted. The chart thus produced will be very weak. You will become disillusioned with the process. And in the process, you'll give DACUM a bad name, unintentionally setting back the cause of CBE.

There is another tendency that must be mentioned. Some institutions attempt to use parts of the DACUM process, and they dignify the effort by calling it a "modified DACUM approach." They may use a committee of instructors rather than incumbent workers. They may appoint an untrained coordinator. They may attempt to do the entire job in a one-day meeting. All these ill-advised modifications have serious effects on the quality and validity of the final results and are certainly not recommended.

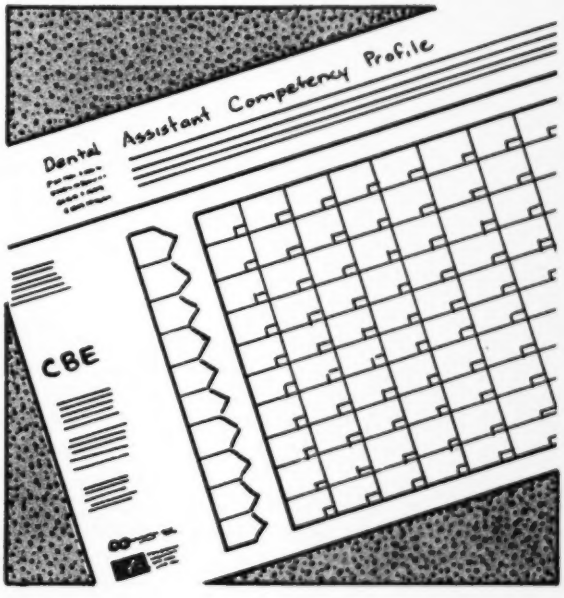
Instead, you should foster the idea of organizing a good occupational analysis procedure for your school or college. Then you should work together with others (e.g., curriculum developers, support staff, administrators) to examine the DACUM process further and to work to improve the whole curriculum development system at your institution.

It is possible for you to secure DACUM charts that have been produced by other institutions if you wish. For example, an organization called the DACUM Exchange serves as a clearinghouse for information on the DACUM process and also distributes DACUM charts for a long list of occupations.

By contacting the exchange, you can get a computer printout of all available charts at no charge. For each chart you order from the list, there is a small charge. (DACUM Exchange; Humber College of Applied Arts and Technology; 205 Humber College Boulevard; Rexdale, Ontario, Canada M9W 5L7)

While DACUM charts developed at other institutions may be very helpful to you, there are three points to consider. First, the relevant charts may not be quite on target for the specific occupational program you have in mind. Second, charts vary in quality and in how up-to-date they are.

Finally, it is highly desirable that each institution go through the process of developing its own charts. Doing so helps ensure that local conditions and needs are met and that your institution's instructional staff feel a sense of ownership for the vocational-technical program.



SAMPLE 5

CBE PROGRAM DEVELOPMENT GRID

—COMPETENCIES—

	1	2	3	4	etc.
Devise learning activities					
Determine instructional location					
Obtain occupational equipment					
Obtain occupational tools					
Obtain occupational supplies					
Identify human resources					
Select print materials					
Develop print materials					
Select audiovisual materials					
Develop audiovisual materials					
Select audiovisual equipment					

SOURCE: Holland College, Charlottetown, Prince Edward Island, Canada

Writing/Refining Task Statements

At some point in the occupational analysis process, you need to take a hard look at the task statements themselves. Granted, you should not be making any substantive changes in the task list. However, whether the list is derived from DACUM, from an outside study, or from any other source, the statements may well need some refinement and polishing.

Each task statement must be as clear as possible, so that it is easily and correctly understood by workers and instructors in the occupational area. The terminology used must be consistent with current occupational usage, and it must be unambiguous—that is, clear enough so that it means the same thing to everybody who reads it.

You should keep in mind that task statements are to be used as a basis for training workers. Statements that are too vague and general, no matter how fine sounding (e.g., *Maintain rapport with the clientele*), may be quite useless as a guide for planning instruction or evaluating performance. Task statements that are extremely specific or even trivial (e.g., *Count nuts, bolts, and washers*) may involve no special training or may require very short bits of training time and, therefore, may not be helpful.

A task statement is not a behavioral objective. Therefore, it includes no component describing the **conditions** under which the task will be performed nor any **criteria** for evaluation. It is simply a very brief description of a unit of work. The components of a task statement are as follows:

- **Action verb**—It is understood that the unstated lead-in to each statement is "The student/worker is able to." Thus the verb that starts each task statement must be worded so as to finish that lead-in (e.g., [The student/worker is able to] *select, prepare, maintain, operate, organize, produce*).

  In addition, the verbs must describe observable actions. Thus, verbs such as *understand, appreciate,* and *value* are not acceptable.
- **Object**—The object is the thing or person utilized or acted upon by the worker (e.g., *tools, equipment, records, materials, customers*).
- **Qualifier**—Sometimes qualifiers are used to limit or modify the task statement (e.g., *according to manufacturer's specifications* or *every month*).

The following are examples of the parts of task statements: *Prepare* (verb) *budgets* (object). *Maintain* (verb) *sickroom equipment* (object). *Select* (verb) *construction lumber* (object) *in accordance with local codes* (qualifier).

In short, before you consider your task list to be complete, you need to critically evaluate your task statements to be sure that (1) each one meets the requirements for a good statement and (2) they are all worded in a consistent and parallel manner. Guidelines for refining task statements are provided in sample 6.

Verifying the Task List

Verifying a task list is a process that confirms that the items listed are, in fact, the tasks that your students will need to be able to perform when they enter the occupation. To verify the tasks, the task list is submitted to people currently active in the occupation for their critical examination.

These experts are asked to verify whether each item is actually part of the occupation. They may also be asked to suggest additional tasks that, in their opinion, appear to have been omitted.

There are a number of reasons for subjecting a task list to a verification process: (1) to locally verify a task list developed elsewhere, (2) to verify a locally developed task list, and (3) to reverify a previously developed task list to ensure that it remains up-to-date.

Local verification of a task list developed elsewhere. It has already been mentioned that task lists developed elsewhere must be locally verified to ensure that they fit the local situation. The tasks listed may be affected by local codes, regulations, or laws. There may be special practices, tools, or equipment used by the particular industrial firms or businesses in which you place your students.

In addition, union agreements in your area may affect which tasks are performed by workers in the occupation analyzed. Even climatic conditions may affect which tasks on the list are actually performed locally.

Verification of a locally developed task list. When the task list has been derived using a conventional occupational analysis process, verification of

SAMPLE 6

TASK STATEMENT GUIDELINES

Watch out for statements that describe school requirements (such statements often start with such verbs as *list, explain, describe, know*); these should not be included with the occupational tasks.

Each task statement must describe an observable behavior. Thus, knowledge and responsibility items (e.g., those beginning with such phrases as *know the principles of, understand the implications of, be aware of, be responsible for*) are not permissible.

Worker attitudes are not tasks or skills, even though positive attitudes may be necessary if the task is to be performed in an acceptable manner. Thus, attitudinal items (e.g., *Enjoy meeting the public, Be alert*) are not permissible.

Receiving instructions from others (e.g., *Attend meetings or conferences, Receive orders from supervisor*) should not be considered a task.

Avoid statements that do not involve a skillful performance (e.g., *Be available when required for emergencies, Relay forms*). If a skillful performance is not involved, it is not a task.

Avoid verbs that are indefinite as to meaning (e.g., *work with, handle*). If a person "works with" a program or resource, you need to determine what is actually being **done** when the activity takes place. There may in fact be several tasks involved.

Task statements should represent independent activities and not simply supplement or expand on other statements (e.g., *Prepare daily work schedules* should not be used to supplement *Prepare work schedules*).

In general, avoid using multiple verbs in a task statement, unless several actions are always performed together. If two action words are needed, this usually indicates that two tasks are involved.

Do not include words such as *effectively, carefully* or *thoroughly* (e.g., *Communicate effectively, File materials carefully*). It is understood that workers are not going to be trained to be ineffective or careless.

The use of qualifiers is optional. Qualifiers should be used only when necessary to clarify the meaning of the task statement. Avoid redundant qualifying phrases (e.g., *when appropriate, as required, in accordance with regular procedures*).

Each task statement must be capable of standing alone. A statement (e.g., *Prepare other materials*) might appear to be reasonable if it appears at the end of a series of related tasks, but it cannot be understood by itself so it should not be used.

Repetition is acceptable. If *operate* is the appropriate verb for many task statements, use it. Do not attempt to find alternatives simply for the sake of variety.

Each task statement must be a complete sentence (subject understood but not stated). Single words or short phrases without action verbs (e.g., *daily schedules, bedmaking, state safety reports*) are topics that may mean something to the writer, but they do not clearly communicate what it is the worker does on the job.

Short words should be used in preference to long words or expressions (e.g., write *Maintain a filing system* **not** *Take necessary action relative to setting up a system for the storage and retrieval of records and reference materials*).

Avoid the use of *etc.* If an additional thought needs to be included, express it (e.g., write *Maintain a security system for controlling the use of drugs and hazardous equipment* **not** *Maintain a system for controlling dangerous substances, etc.*).

Abbreviations should not be used. Spell out words so anyone can understand the statement, not just workers in the occupation.

Negative statements (e.g., *Do not use profanity on the job, Avoid talking to outsiders about company policy*) are seldom valid. **Not** doing something is hardly a trainable skill.

the tasks is an inherent part of that process. The initial task list is developed by those conducting the occupational analysis, using a variety of available resources. Verification of the tasks by incumbent workers is needed to ensure that the tasks listed reflect reality.

When the DACUM process has been used to identify the tasks, you may or may not need to submit the list for further verification. It will depend on your situation, your purposes, and your resources.

In general, further verification is not necessary. If you have selected your DACUM committee with care and produced a good, up-to-date chart, the process has verification built into it.

Assume, for example, that your DACUM committee was representative of the employment situations into which your students will be placed. Assume that you plan to reverify the task list periodically to ensure that it remains up-to-date. Assume that you have limited resources. Given those assumptions, immediate further verification of the list would probably be unnecessarily time-consuming and costly and would serve no useful purpose.

However, there are a number of valid reasons for further verifying the DACUM task list. First, a DACUM committee is small and may not always be representative of the occupation. Greater confidence that the tasks identified are, in fact, the really important ones may be gained by having other experts review it for completeness and accuracy.

If, for example, students in your program seek employment over a very wide geographic area, it would be profitable to verify the task list using a sampling of expert workers from that wider area. Similarly, if the occupation is so broad that the DACUM committee was not truly representative, then further verification would be justified. Through verification, students could be assured of being prepared for employment, regardless of where they were employed.

Second, other types of data (e.g., how frequently each task is performed, how important each task is, how difficult it is to learn to perform each task) may be readily obtained through the verification process. If it is important to you to gather a wide range of data concerning the task statements, then verification can accomplish that purpose.

Third, involving a larger number of qualified workers and supervisors in reviewing the task list can have a very positive public relations value. Thus, if you wish to secure as much input as possible in order to promote your program with local employers and ensure program credibility with those employers, then a verification process can be helpful.

And finally, further verification would be especially important if the results were to be used for state (or regional or national) curriculum development or instructional purposes.

Reverification of a previously developed task list. As mentioned in prior discussions, the task list must be reverified periodically—again, by people in the occupation—to ensure that it represents the current state of the art. In these times of rapidly changing technology, periodic reverification is crucial.

It is, in fact, partly because of this built-in, periodic reverification and those rapid changes in technology that initial verification is considered by many to be unnecessary.

Consider, for example, a computer sciences program, where the instructors have a small percentage of time allowed for curriculum development. And consider the time it takes to produce a verified task list—to define the occupation with the assistance of the advisory committee, organize and convene a DACUM committee led by a trained coordinator, refine the task statements, identify persons qualified to verify the list, submit the list for broad verification, and analyze and incorporate the results.

In the field of computer sciences, after all that time and effort, the list may easily be out of date before it is used as a basis for instruction. And the instructional planning and development process then takes additional time.

The Verification Group

Regardless of the scope of your verification effort, the people asked to verify or reverify task statements should be either (1) workers presently employed in the occupation or (2) supervisors of workers, with direct responsibility for getting the work done. Furthermore, they should represent the full range of employment situations (occupationally or geographically) into which students will be placed.

Again, no high-level administrators, bosses, theoreticians, or educators should be involved.

Selecting a verification group need not be difficult. For example, your **occupational advisory committee** may be perfect for the job—if it is composed of the right kind of people. By involving them at this point, you will be accomplishing several things at the same time. First, you will be verifying your proposed task list—the main purpose of this exercise.

Second, you will be keeping the advisory committee members informed about and involved in the CBE implementation effort. And third, their involvement will probably help you gain their further understanding of and support for the effort.

Sometimes, however, the advisory committee isn't suitable. It may include too many employers and not enough workers and supervisors. It may not include workers and supervisors from a wide-enough geographic area. In that case, you can convene a **verification committee** that will meet just once, solely for the purpose of reviewing your task list.

You can select members for this committee (10–15 members is a workable range) on the basis of your own acquaintance or recommendations from knowledgeable people in the occupation. You may have to arrange to pay committee members for travel and per diem if they come from any distance to work with you for a day. No honorarium should be necessary.

When circumstances require the use of a **full-scale verification procedure**, a mailed verification instrument can be used. In that case, the size and composition of the verification group would depend upon your purposes and your resources.

The verification group could include the total population of practitioners in a defined region. Or, from the list of all practitioners in a defined region, a table of random numbers could be used to identify a sample of a manageable size for your purposes.

Though widely used, these two approaches have a potentially serious weakness. Some (or many) of the responses you receive may come from individuals who do not have the best personal or professional qualifications. Yet an entire instructional program will be built on those responses.

Therefore, it is generally recommended that you select a group of practitioners who have been specifically recommended as being professionals with a high level of training, up-to-date skills, and excellent professional standards. In that way, the instructional program built on the verified task list will have the best possible chance of producing the quality of workers desired.

The Verification Process

If an advisory committee or verification committee is used, the verification process can be very simple. You can convene the committee (for one meeting, a series of meetings, or a full-day session) and ask them to review the tentative task list. It might help the committee members if you furnished them with a copy of the list ahead of time so they could be prepared for the discussion.

It is very important that you structure the verification task. Committee members should be asked to review the list, one duty area at a time. The group should consider each task statement individually, moving along if there are no questions or problems.

It is, on the other hand, very inefficient simply to throw open the meeting with the general comment, "Does anyone have any suggestions for additions or deletions?" Such an approach tends to lead to haphazard discussion, with little assurance that the work will be done thoroughly and thoughtfully.

Assuming that your original task list was thoroughly developed, there should be relatively little that requires significant change. However, any recommendations that are made by the committee should be acted upon.

If a full-scale verification procedure is to be used, the verification process becomes more complicated. For one thing, a data-collection instrument must be carefully developed. Furthermore, to structure the process, certain decisions will need to be made: Who will conduct the verification? Who will participate in the actual verification? What questions will be asked?

In all likelihood, three parties should be involved in making these decisions: an appropriate administrator, instructors/curriculum developers, and advisory committee members.

In preparing the survey instrument, you need to consider carefully what kind of information you need. Are you interested only in verifying that the skills on the task list are real and relevant? If so, you can ask incumbent workers simply to review the list and place a check beside each item that is, in fact, performed as part of their job.

If, however, you want to gather other information to help you organize and develop your curriculum, your verification instrument will need to include space for other responses. You might, for example, want to gather such information as the following about each task: (1) whether the task is performed by beginning workers, (2) how frequently the task is performed, (3) how difficult it is to perform the task, or (4) how difficult it is to learn the task.

Be reasonable though. Don't ask a lot of questions just for the sake of asking. Before including any question, know exactly why you need that information and what you are going to do with it. Sample 7 illustrates a partial verification instrument.

You can mail the instrument to the selected group of workers and then plan to remind nonrespondents with a follow-up letter. The cost of this approach involves the printing of the instrument, postage, and secretarial services.

If verification is to be done through observation/interview techniques, you will need to have trained interviewers, a written introduction to employers, specific written instructions for interviewers, and sufficient staff time to conduct the interviews.

SAMPLE 7

PARTIAL VERIFICATION INSTRUMENT

Instructions: Below are listed tasks, organized by duty areas, that may be needed by beginning office clerical employees. We need your help in determining which tasks actually **are** performed by beginning workers. We would like to get your personal reaction to the following question about each task:

Is this task important for a beginning office clerical employee?

Please read each task statement. Then, for each task, choose and circle the number in the right-hand column that most accurately reflects the importance of that task. Use the scale below to rate each task:

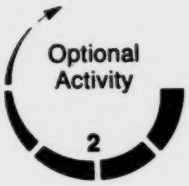
3 = Of Great Importance	Task is necessary—frequently performed or critical to success
2 = Important	
1 = Of Little or No Importance	Task is not needed—performed infrequently or not at all, not critical to success

TASKS	IMPORTANCE OF TASK		
Operating Typewriters			
Make carbon copies	1	2	3
Determine appropriate format	1	2	3
Type documents from rough drafts	1	2	3
Type tables	1	2	3
Type reports and manuscripts	1	2	3
Type minutes of meetings	1	2	3
Reproducing Materials			
Replace paper in machines	1	2	3
Detect machine malfunctions	1	2	3
Take measures to correct malfunctions	1	2	3

In both cases, the data received must be tabulated and interpreted, and the task list must be modified accordingly.[2]

The whole process of developing a verified task list is demanding, no matter how it is done. That is probably why it sometimes fails to get the time and attention it requires. However, nothing is more crucial to the worth and the success of your CBE program. With a verified task list in hand, the battle to install a solid competency-based occupational training program is half won.

2. To gain skill in constructing a verification instrument, using observation/interview techniques to verify task statements, and tabulating and interpreting the data received from your verification efforts, you may wish to refer to Module A-7, *Conduct an Occupational Analysis*.



You may wish to view the 20-minute videotape, "Performance-Based Training in Atlantic Canada." Note particularly how instructional content is derived. As the DACUM process is described, note (1) the makeup of the DACUM committee, (2) desirable characteristics of committee members, (3) the role of the instructor, (4) steps in the analysis process, and (5) the final chart of skills that results.

For more in-depth information on the DACUM process, you may wish to review the following supplementary reference: Norton *DACUM Coordinator's and Facilitator's Handbook*. This handbook describes DACUM in general and then explains each step in the process, including:

- Planning the workshop
- Selecting committee members
- Conducting the orientation
- Facilitating group interaction
- Constructing the initial DACUM chart
- Verifying the tasks
- Producing the final DACUM chart

Numerous appendices are provided in the handbook, with examples of completed DACUM charts and other support materials.

Please note, however, that simply reading the document will **not** prepare you adequately to conduct the DACUM workshop on your own. Hands-on training, under the supervision of an expert coordinator, is required before you should attempt to serve in this role.

You may wish to read the introductory section of a V-TECS catalog from your own occupational service area. In this section (usually pages ix through xvi), you can read about the following:

- What is V-TECS?
- What does a typical V-TECS catalog contain?
- What are the potential benefits of the V-TECS catalogs?
- How are V-TECS catalogs developed?
- What do V-TECS catalogs have to do with competency-based education and the instructional process?

The following case studies describe how some vocational educators identified the competencies to be included in their vocational-technical programs. Read each situation and **critique in writing** the educators' actions and/or plans. Include in your critique an explanation of how the situation should have been handled if a true CBE program is to be developed.

CASE STUDIES

Case Study 1:

In an office at Rocky Creek Vo-Tech Center, the teacher of residential wiring, Peter Watts, and the school's curriculum specialist, Dr. Rosemary O'Dell, were going over the program's task list. The list had been identified by a university study of incumbent workers. It had then been verified by a committee that included (1) appropriate members of Mr. Watts's advisory committee and (2) other representative workers and supervisors from the occupation.

Dr. O'Dell seemed generally pleased with the results. However, as she admitted, she was no expert in electrical wiring.

"There seems to be an important area missing though," she said pensively. "Students need to be able to communicate—to speak, listen, read, and write. I know the Academic Council will want to see a task list that highlights those skills. I think we need to add a duty area to your list that focuses on communication skills."

Mr. Watts started to say something, but he thought better of it. Instead he added a duty area covering communication to his task list. Then he helped Dr. O'Dell generate task statements for the new duty area.

"I like the way you handled the job of developing the list, Pete. With our few additions, I think we have a task list that includes all the skills we know students need. In addition, it now looks very respectable and will undoubtedly gain the approval of the Academic Council," said Dr. O'Dell, as she rose to see him out of the office.

Case Study 2:

The three respiratory therapy instructors at Cogent Community College were not pleased. In general, they were not keen to change to CBE. In particular, they saw no point in using incumbent respiratory therapists to identify their program competencies.

After all, their present program was highly successful. The pass rate for the state licensure examination was very high. Every graduate who wanted a job could be easily placed. More students wanted to enroll than the program could accommodate. And the entire staff was fully qualified for their positions.

The three instructors decided to present their case to the director of occupational education. They explained to the director that they felt their staff was perfectly capable of developing their own list of competencies. They knew what they needed to teach, and they had refined their program over the years.

"Furthermore," they said, "we keep up-to-date by being in constant touch with the profession in the clinical phase of the program. It is admittedly a tough program with much to learn, but most students succeed and the staff like to teach it the way it is. Why tamper with a good thing?"

The team of instructors concluded by proposing that they be allowed to derive the required task list from their course outlines, lecture notes, and final examinations. The director appeared somewhat uneasy as he tried to think how to respond.

Case Study 3:

As chairman of the CBE curriculum committee, it was Gary Gantz's responsibility to meet with the agricultural education faculty and explain the procedure to be used to generate and verify the content of the poultry production program. He outlined the procedure as follows.

"Your faculty is responsible for developing the tentative task list. Once that is developed, a group of 40 or 50 agriculture people (workers, supervisors, poultry farmers, equipment dealers, packing plant managers—all friends of the program) will be gathered for a dinner meeting. After a good meal, Earl, you can warm them up with a few of your choice jokes. Then the group can get down to the business of voting on each item on the list.

"A coordinator will read each task statement (you probably should use Bob for that; he has a fine loud voice). Each participant will hold up a blue card if he or she agrees that the statement should be included in the task list. If the participant disagrees, he or she will hold up a pink card. Those not holding cards aloft will be considered as having no opinion.

"Maureen, you need to have a team ready to tabulate the results and produce a printout by the

end of the evening. After all the tentative items have been voted on, I will open up the meeting to get suggestions for additional task statements from the floor. The whole process should be completed and neatly baled up in about three hours."

As he finished his explanation, Gary looked around the faculty group for signs of general approval.

NOTES

Compare your written critiques of the educators' performance with the model critiques given below. Your responses need not exactly duplicate the model responses; however, you should have covered the same **major** points.

MODEL CRITIQUES

Case Study 1:

Peter Watts is in a situation that goes to the very heart of CBE. Who are we going to trust to identify the skills that workers need on the job? Who shall say what vocational students need to learn in school? Is academic respectability a relevant factor in developing an occupational task list?

The way in which the task list for the residential wiring program was produced seems to have been perfectly sound. And the list was verified by a representative local committee of incumbent workers and supervisors. Thus, it is probable that the tasks on the list were the ones that beginning workers would actually need to be able to perform on the job. These were the tasks, then, that Peter Watts should have included in his instructional program.

If you believe that any job can be described in terms of the tasks performed by workers, and that expert workers are better able to describe and define their occupation than anyone else, then the idea of someone else adding competencies to the identified list just doesn't fit.

Granted, the need for vocational-technical students to possess adequate communication skills is receiving increasing attention. But if communication was a major duty area in this particular occupation, then that fact should have surfaced in the rigorous process of analyzing the occupation and verifying the task list.

Since communication had not been identified by electricians as a duty area, Dr. O'Dell should not have arbitrarily added it to the task list for electricians. Individual interests and personal preferences are out of place here—no matter how well-intentioned.

Most likely, had Dr. O'Dell been familiar with the trade, she would have found, upon closer examination of the task list, that communication skills were indeed included—implicitly or explicitly—in the task statements listed. If, however, that failed to be the case, the school could choose to develop a **separate** list of additional competencies that students in that school would be expected to achieve.

If the CBE program at Rocky Creek is to succeed, those in decision-making positions must recognize the validity of basing instructional programs on occupational tasks that have been identified by expert workers as those they are required to perform on the job. And they must learn to respect the fact that a task list identified in that manner must not be changed in any substantive way. Whether the completed task list looks "academically respectable" or not, it should form the basis for vocational-technical instruction.

Peter Watts is in a difficult position. He has used good procedures and he knows the electrician's trade, but he failed to defend himself and his task list. It is understandable that he might be intimidated by Dr. O'Dell's title and position of authority, but he should not have compromised one of the essential elements on which CBE is founded.

Case Study 2:

It is hard to knock success. The fact that students are enrolling, learning, and getting jobs means that the staff are doing something right. Actually, the world wouldn't come to an end if the staff did just what they propose—that is, use their own knowledge and experience to develop a task list for the respiratory therapy program. Of course, when they got through, the program would obviously look almost exactly as it does now.

In their pride in the present program, the staff are overlooking some potential advantages to using some form of occupational analysis (the DACUM approach would be a natural in this situation). Assuming that no program is perfect, there is every chance that improvements could be made.

No matter how well they work with the profession of respiratory therapy, the community college staff are not now respiratory therapists in the sense they once were. They are now primarily instructors and have developed the interests, concerns, and viewpoints of instructors.

A fresh look at essential tasks by a group of incumbent workers would help ensure that the program was up-to-date in the tasks it teaches. It would also ensure that the program had the current perspectives and approach of the profession.

There is always the possibility that what teachers like to teach and feel comfortable teaching may not exactly fit the needs of beginning workers. There may be new developments, and some tasks that had previously been important might be deemphasized or eliminated. Thus, involving incumbent workers can help keep the learning load for students realistic and feasible.

Conducting an occupational analysis in this case would have two other benefits. The first is that there would be a validity check concerning program content. Even though the resulting task list might be very similar to the one that would have been developed by the instructors, the analysis provides outside evidence that the program is indeed current and reflects conditions in the profession.

This verification of program content should be reassuring to the college administration, the community, prospective students, and the profession itself. It should also give the staff renewed confidence in their own efforts.

The second benefit is mostly one of public relations. Involving respected expert workers in defining program content can help tie the program to the profession. Those workers "own" the program, so to speak, and often become vocal supporters of it as a result.

Cogent Community College also has a stake in this. If the profession later questions or complains about some aspect of the program, the college can say, "There must be something wrong here. We are simply teaching exactly what you told us that beginning workers need. If there has been some change, we need your help in revising our program." It may even be possible to get additional needed equipment from the profession in this way.

In sum, the current strengths of the respiratory therapy program would not be jeopardized by a formal occupational analysis. Quite the contrary. Much good would probably result, though the staff might have to make some personal adjustments to accept this.

Case Study 3:

That should be quite an evening! What with plenty of food and roisterous fellowship, everyone should have a good time. This is fine for building close relationships with the community and the occupation. The group may even feel they've contributed something constructive to the program. As a way of building a curriculum, however, the evening is likely to be a complete flop.

For one thing, a verification committee of 40 or 50 people is out of the question. There can be no discussion, no real interaction, and no way for consensus to emerge. It will be strictly a voting procedure—something that could be done better by mail—and it isn't what is needed anyway.

What is needed is time to look carefully at each task statement and decide whether to accept it, reject it, or refine it. Instead, each statement will be read at the group, and then they will instantly have to vote one way or the other—with little time for thought.

Some people invited to the affair may be incumbent workers in poultry production, but it would appear that others are far removed from knowing the specific tasks of the occupation. From what we know, the only things they have in common are their work in the general field of agriculture and their acquaintance with the school's faculty.

It's difficult to see how a valid list of occupational tasks can emerge from such a diverse group. It is to be hoped that, just because they've borrowed the term *coordinator,* Gary's curriculum committee doesn't think that the group they are assembling qualifies as a DACUM committee.

Allowing for discussion from the floor to obtain additional suggestions for tasks to be included won't help much. The whole activity is likely to be so unstructured that the person with the strongest opinion will carry the day. This approach may seem to be efficient, but the information gathered will not necessarily be valid.

Gary and his committee should, like chickens, start from scratch. A faculty group could be asked to develop a defensible tentative task list for poultry production by (1) consulting existing resources and then (2) reworking and refining the list based on their own experience and knowledge of local conditions.

This tentative list could then be submitted to a verification committee of 10–12 people who work daily in the poultry business and are well informed about new developments. In a series of meetings, the committee could go over each task and come to consensus concerning its place in the final task list. Additions to the list might emerge as the committee tackled one duty area after another.

That might not be as entertaining as the method Gary proposed, but it would accomplish a lot more.

Level of Performance: Your written critiques of the educators' performance should have covered the same **major** points as the model critiques. If you missed some points or have questions about any additional points you made, review the material in the information sheet, Developing a Task List, pp. 7–27, or check with your resource person if necessary.

NOTES

The following activity is designed to check your ability to recognize the characteristics of a correct task statement and to rewrite incorrect statements. The analysis form below includes statements that may or may not be correctly stated task statements. Read each statement, and write a brief sentence or two describing its weaknesses and strengths. For any statement that is weak, either (1) indicate that it should be deleted or (2) rewrite it so that it is correctly stated.

ANALYSIS FORM

1. Understand the importance of maintaining the confidentiality of trade information

2. Relay telephone messages to other office personnel

3. Write technical reports

4. Given a sample of three letters of application, make needed corrections with 100 percent accuracy

5. Revise technical memorandums thoroughly and carefully

6. Liaise with users of the product

7. Proper use of dictaphone, cassette recorder, etc.

8. Perform other writing duties as required

9. Attend staff meetings as appropriate

10. Write instruction sheets and prepare them for duplication, using standard company format

11. Express ideas clearly in writing and speech, using layman's terminology to be sure to be properly understood by customers and to be accepted by the general public

12. Take grievances through proper designated channels

13. To dress and be groomed attractively at all times

Compare your written responses on the analysis form with the model analysis given below. Your analysis of the statements need not exactly duplicate the model responses; however, you should have covered the same **major** points. Your rewritten task statements should follow all relevant guidelines for such statements, as described in sample 6, p. 23.

MODEL ANALYSIS

1. This statement does not describe a performance or an observable skill; it is not a task. The terms *understand, be aware of, appreciate,* and so on, are not acceptable in task statements. There is a trainable skill involved here, however. The statement could be rewritten as follows:

   Maintain confidentiality of trade information

2. Relaying information or instructions to others is not a substantive task. If there is a task here at all, it is probably trivial and requires little or no formal training. The statement should be omitted from any task list.

3. Although it contains only three words, the task statement is complete and correct. It has an action verb (*write*) and an object (*technical reports*), and it needs no qualifiers. Anyone in the occupation will know what it means, and the statement can clearly be used as a basis for planning instruction. Leave it as is.

4. This is not a task statement; it is a behavioral objective—a statement for instructional and evaluation purposes. It includes components (conditions and criteria) not found in task statements, and it doesn't describe what a worker does on the job. We have to guess a little bit, but there probably is an occupational task embedded in this statement, as follows:

   Write letters of application
   or
   Revise letters of application

5. The revision of technical memorandums is indeed an occupational task that can be taught in a training program. The only things objectionable are the last words: *thoroughly and carefully*. These words add nothing to the statement; trainees aren't going to be taught to be haphazard and careless. The statement could be rewritten as follows:

   Revise technical memorandums

6. Who knows—perhaps to *liase* is an actual teachable skill, but it is difficult to tell. The term is both obscure and ambiguous. These are not characteristics of a good task statement. Though they are describing communication skills, the writers of this statement didn't communicate very well. Perhaps the statement could be improved as follows:

   Establish communication with customers in both written and spoken form

7. You might find a topic like this in a course of study or lesson plan, but in its present form, it is not a task statement. What it needs is an action verb. It could be rewritten as follows:

   Transcribe copy using a dictaphone or cassette recorder

8. Every task statement should be able to stand alone; this one doesn't. It is apparently part of a series, which we would have to see in order to guess what might be meant by *other duties*. Incidentally the words *as required* don't add anything—they could be tacked on to almost any task statement. An example of an independent statement might be as follows:

   Write notes, memorandums, and letters

9. Attending meetings, conferences, or classes is not a skill. Neither is relaying information or being available. No important training is required. It is what one does during the meeting that may be important. Omit this statement.

10. This is a classic example of two tasks hiding in one statement. The skill involved in **writing** instruction sheets is quite a bit different from that of preparing them for duplication (the latter might simply involve typing). The qualifier, *using standard company format,* is useful in this task statement. The two tasks should be split up as follows:

    Write instruction sheets using standard company format
    and
    Prepare instruction sheets for duplication

11. As a task statement this is much too long. It is, in fact, a little speech, with a lot of unnecessary verbiage. Otherwise, there is a definite task involved. It could be rewritten as follows:

    Express ideas clearly in writing and speaking to the general public

12. This statement has what it takes to be a task. It has a cognitive element certainly, but it is an observable, trainable skill. There is both an action verb and an object. Don't change a thing.

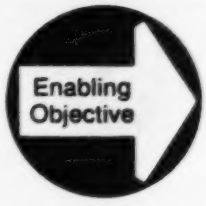
13. The initial word *to* gives it away. This is not the way task statements are written. Of course, there is an occupational task here that needs to be dealt with in training programs for people who meet the public (e.g., receptionists, bank tellers, salespeople). The statement could be rewritten as follows:

    Maintain attractive dress and grooming appropriate to the occupation

Level of Performance: Your written responses on the analysis form should have covered the same **major** points as the model analysis. Your rewritten task statements should follow all relevant guidelines for such statements. If you missed some points, failed to meet some guidelines, or have questions about any additional points you made, review the material in the information sheet, Developing a Task List, pp. 7–27, or check with your resource person if necessary.

Learning Experience II

OVERVIEW

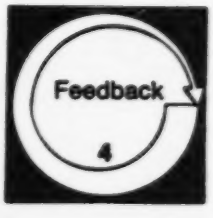


After completing the required reading, demonstrate knowledge of the procedures used in organizing an occupational task list for purposes of planning instruction.

You will be reading the information sheet, Organizing the Task List, pp. 42–45.

You may wish to interview a vocational teacher in an operating CBE program to determine how that teacher identified occupational tasks and organized them for instruction.

You will be demonstrating knowledge of the procedures used in organizing an occupational task list for purposes of planning instruction by completing the Self-Check, p. 46.



You will be evaluating your competency by comparing your completed Self-Check with the Model Answers, pp. 47–48.

Once you have identified and verified tasks performed by workers in an occupation, you must organize those tasks for instructional purposes. For information on clustering and sequencing these tasks and determining the limits of your instruction, read the following information sheet.

ORGANIZING THE TASK LIST

Even when you have a refined and verified task list, there are still a number of things to be done before you are ready to begin developing your instructional program. Depending on the model on which your program is based, you may need to cluster or group the tasks into somewhat larger units of instruction.

You will also need to sequence the tasks or clusters in order to increase learning and teaching efficiency. Finally, you will need to plan entry points and student advancement procedures so students can progress through the curriculum smoothly and efficiently.

Incidentally, at this point the statements on your list generally begin to be referred to as program competencies rather than occupational tasks.

Clustering Competencies

By clustering the competency statements on your list, you create appropriate and logical groupings that can serve as a basis for developing instructional materials and devising instructional activities. Thus, you might cluster two or three related competencies to form the basis for a learning experience (e.g., a learning guide or module).

Not every program clusters competencies. Some vocational educators (particularly those using the DACUM approach to curriculum development) contend that each competency on the list or chart is important enough to stand alone. Each competency is given separate treatment. Each forms the basis for a single learning experience. And students are evaluated on their performance of each individual competency.

Other CBE program developers cluster the competencies (1) to emphasize the logical relationships that various competencies have with each other and (2) to minimize any repetition or overlap that may occur if competencies are treated separately. Then, too, clustering reduces the number of learning packages that must be developed and makes implementation somewhat more manageable.

As an instructor experienced in the way students learn and knowledgeable about your subject matter, you are in the best position to do the job of clustering.

A cluster is a group of competencies that can be organized into a single learning experience. Any one learning experience may include just one competency, a cluster of two, or perhaps as many as five. There must be some rationale for the cluster or some relationship among the competencies. For example, competencies may be clustered on the basis of instructional efficiency, learning theory, educational logic, or the size and complexity of the competencies.

The following guidelines should be kept in mind as you cluster the competencies on your list:

- Consider the potential **learning effectiveness** of forming certain clusters of competencies. Competencies that share the same basic knowledge components, that are logically related, and that can be readily learned together may be clustered into a single learning experience.
- Examine the possible **instructional efficiency** of a cluster. Competencies that are readily taught in sequence or simultaneously or that share similar procedures or terminology may be grouped to form one learning experience.
- Consider the **locations** and **facilities** required for achieving various components. If two or more deal with the same equipment or require a similar special field setting, it might be beneficial to group them together.
- Estimate the **learning time required** for each competency. While there is no time limit for completion, the work involved in achieving a competency should not be simply a matter of minutes. Therefore, a few minor and related competencies can be grouped together. On the other hand, don't cluster competencies when the resulting combination may take weeks for a student to achieve.

Sequencing Competencies

Most educators agree that it is essential to place the competencies in some form of order or sequence. Usually, the clusters are formed first, and then the clusters are put in a learning sequence.

To a certain extent of course, students in a CBE program will—through individual conferences with their instructor—select the order in which they will pursue competencies. Factors such as the student's previous experience, present career goals, personal interests, and learning efficiency all affect this individual sequencing process.

Even so, a general sequence should be established for the whole list or chart. During a DACUM analysis, this is one of the final tasks of the committee.

Sequencing the competencies for instruction is not extremely difficult. There are several logical sequencing patterns you can follow. There are also a number of individual factors you need to consider, any one of which may conflict with another equally important factor. However, don't be alarmed. Exact sequencing isn't quite as critical in a CBE program as it is in a conventional, group-paced program.

The following guidelines can be applied to determine an effective order for instruction.

Sequence the competencies for early need. There are, in almost every occupation, some basic skills that students need to have achieved before they can go on. For example, cooking success begins with exact measuring. Therefore, the competency, *Measure basic ingredients*, must be learned very early.

In a horticulture program, sterilizing the soil is something students must do on their first job—and every other job. In many trade and industrial programs, safety and emergency procedures must be learned early, because students will be dealing with hazardous equipment and situations right from the start.

All these competencies, therefore, should appear near the top of the list (or near the left-hand side of a chart).

Develop chains of competencies. Recently educators have become more conscious of the need to analyze competencies to determine which are required before others can be attempted. For example, bakers can't successfully bake bread until they can operate the electric mixer. But that skill won't be of much value until they can identify and measure ingredients. And before that, they must know how to read a recipe.

Most occupations have a number of such chains of competencies—some long, some short. Be careful, though, that you don't develop long sequences, which aren't really necessary, just because the competencies have traditionally been taught in that order.

Sequence from simple to more complex. The completed competency list should be arranged so that the skills that are simpler and easier to learn precede the more difficult and complex ones. Students should be able to experience success right from the beginning—as well as throughout the program.

Ideally, each competency achieved by a student should be somewhat more complex than the preceding one. However, it is usually not possible to always maintain such a uniform progression.

Build one competency on some other competency that the student can already perform. When new competencies are tied to competencies that a student has already achieved, they have a lot more meaning and relevance and become springboards for further learning.

Plan the competencies in a typical job sequence. In some aspects of an occupation, students must learn not only the skills, but also the order in which they are performed on the job. For the overhaul of equipment, for example, it is necessary that certain operations be performed in a definite order (e.g., disassemble, clean, inspect, repair or replace, reassemble, and test).

Unfortunately, in some jobs the various competencies in a job sequence do not follow from simple to complex. Thus, the most difficult competency to achieve may be the very first one.

Sequence competencies for early productivity. This type of sequencing is especially important for co-op or field-based training, but it may also apply to many other programs. Early in the program, students should achieve the competencies that they will initially need to perform when they are placed on the job.

For example, a gas station attendant can do useful work right from the first day on the job if he/she knows how to pump gas and make change. Other skills, such as changing a tire or doing a lube job, can come later while the student is already productively working.

Sequence to initiate and maintain student interest. In secondary programs especially, student interest is an important consideration—but it helps at any level. Some of the competencies at the beginning of your sequence, therefore, might be selected based on their ability to create initial interest. For example, in a locksmith program, the first thing students want to know is how to pick a lock.

Interest can be retained and rejuvenated by periodically presenting a skill that is known to generate fresh enthusiasm (e.g., in photography, making enlargements; in nursing, assessing a newborn baby). By judicious selection, motivation and interest can be maintained, without doing violence to the natural sequence of competencies.

Sequence to provide exit points to suboccupations. For open-entry/open-exit programs, this may be one of the most important factors to be considered in sequencing. In many vocational-technical areas, it is possible to organize the program to allow students to leave the program to get a job within the occupation, without having to complete the total program.

The competencies must be specially sequenced to ensure that this is possible. In addition, the sequence must allow early leavers to later reenter the program, resume work on the next competencies, and move up the career ladder to full proficiency.

Organizing the Clustering and Sequencing Process

If your program model calls for clustering and sequencing the competencies to form learning packages, you will need to structure the process in a systematic way. The following is a simple procedure that works well:

1. Write each competency from your list on a separate 3″ × 5″ index card.
2. Examine the competencies in a given general area of competence, and group them to form individual learning packages. Apply the clustering guidelines to this task. Clip together the cards that form a learning package.
3. Review the competencies in a cluster, and devise a short title for the learning package that is to be developed to cover them. Write the title on a card, and attach it to the group of cards in the cluster.
4. Organize the clustered cards into a complete instructional sequence. Apply the guidelines for sequencing. Have the sequenced program reviewed by other instructors and/or your advisory committee.

Determining the Effectiveness of the Clustering and Sequencing

You will get some indication of how well you succeeded at the job of clustering and sequencing competencies when you get further into the program development process. When learning experiences (e.g., learning packages) are developed, proper or improper clustering will become apparent in the development process.

It will be easy to develop a learning experience for each cluster if all the competencies included in a cluster are clearly related and share common concepts or experiences. If the development process becomes tortured and difficult, you have a clue that all is not well with the cluster of competencies involved.

Good sequencing will not really be tested, however, until students actually move through the program. If the sequencing is logical, students should have no difficulties with prerequisite competencies or with understanding the relation of one competency to another.

You need to be on the lookout for competencies that appear to stop students cold or give them particular difficulty. That might be an indication that (1) the competency was not properly preceded by the necessary prerequisite competencies or (2) there was an abrupt jump in the level of complexity.

When difficulties do surface, you need to analyze the situation, talk to students about the problems they are having, and adjust the program accordingly. CBE lends itself to this kind of change. Simply changing the position of a competency on the chart or list may be all that is necessary to correct the situation and make student achievement smoother and more efficient.

Specifying Occupational Entry and Exit Points

It was mentioned earlier that, during the sequencing process, you should be aware of points at which students have achieved enough competencies to enter a suboccupation. While vocational-technical teachers tend to want their students to complete the whole program, this may not always be in the best interests of the student.

Consider the case of Dominic, who wants very much to be a full-fledged welder, but who has a wife, and a baby on the way. If he could learn sufficient skills in the welding program, he could get a job as a production arc welder in a nearby shipyard and leave the program at that point. While he was employed, he could then continue the welding program at night to increase his skills.

Or consider Maggie, who is a newly graduated pharmacist. She wants just enough typing skill to be able to type prescriptions and labels. She certainly doesn't need the whole secretarial program, or even an entire course in typing. It should be possible for her to enter the program, acquire those typing skills she needs, and then leave.

In most occupational training programs, it will be possible to identify a number of **exit** points. In some licensed occupations, this may not be the case. However, some programs may have as many as 10 or 15 exit points.

Your occupational advisory committee can help you review the competency sequence for your program and set up exit points based on their knowledge of the skills that employers will expect in the suboccupations. The committee can also assist in determining the **level** of proficiency an exiting student will need in order to be employable in that suboccupation.

Note that you may also want to specify **entry** points for your program. There may be a number of points at which a student can enter the program (1) without being required to have certain prerequisite skills or (2) with the least disruption to the ongoing program. In the interest of instructional efficiency, you need to be able to control these points to some extent so that you can maintain an orderly instructional process.

You may wish to arrange through your resource person to interview a vocational teacher in an operating CBE program who has experience in identifying occupational program competencies and organizing them for instruction. As you conduct your interview, try to gain answers to such questions as the following:

- What existing sources of occupational competencies were consulted?
- What other means of identifying program competencies were used?
- How were the identified competencies verified?
- What factors affected the clustering and sequencing of competencies?

The following items check your comprehension of the material in the information sheet, Organizing the Task List, pp. 42–45. Each of the three items requires a short essay-type response. Please explain fully, but briefly, and make sure you respond to all parts of each item.

SELF-CHECK

1. Some CBE programs group, or cluster, competencies for instructional purposes, while others do not. What is the rationale for each of these two procedures?

2. In a CBE program, students may choose (after conferring with their instructor) to work on specific competencies in any order, according to their own needs, interests, and abilities. Why then should you make any attempt to sequence the program competency list at all?

3. Assume that a school or college can't possibly teach certain occupational skills because of a lack of specific equipment, laboratory space, or instructional staff with the necessary skills. Should these competencies still be included in the program's competency list? Why or why not?

Compare your written responses to the self-check items with the model answers given below. Your responses need not exactly duplicate the model responses; however, you should have covered the same **major** points.

MODEL ANSWERS

1. Whether competencies are to be clustered depends upon the CBE program model for the particular institution. Some CBE programs contend that each competency is an important and discrete unit of instruction, capable of standing alone.

   In such programs, each competency is treated separately, with its own learning package, for example, and its own support materials and media. Students in these programs are assessed on their performance of each individual competency on the list.

   Even so, the competencies may be clustered in practice, because students may choose to work on several competencies at the same time.

   CBE programs that cluster competencies in the curriculum development process do so for several reasons. They believe that, when competencies that are related in some way are clustered together, instruction can be handled more efficiently and students can learn more easily. According to this view, competencies should be clustered if they require the same knowledge base, involve similar psychomotor skills, require the same special facilities or equipment, and so on.

   Clustering can also be used to create larger competencies that maintain a more uniform learning time frame for students. Thus two or three competencies that might each take only a short time to achieve can be grouped to form a more reasonable learning unit.

   Finally, on a practical note, programs that cluster competencies have fewer learning packages to produce.

2. It's true—in most CBE programs, there is not one fixed sequence of learning experiences for all students. It has been found that students progress more quickly, maintain greater interest, and waste less time in repetition when they have a considerable say about the order in which they will tackle the program's competencies.

   It has also been found that prerequisite competencies aren't as numerous or as rigid as was once believed. Students can learn by starting from a great number of points and reach the goal of entry into the occupation by taking a variety of pathways.

   It would be unfair, though, to give students a hodgepodge of competencies, to be taken in any random order. Students need to have some sequence to follow, even though they may deviate from it on occasion. A well-ordered curriculum can serve as a guide. It can, for example, provide a logical progression from simple and easy competencies, to begin with, to complex and difficult ones later.

   The sequence can also show students something of the structure of the occupation itself—with related competencies grouped closely together or with competencies arranged in a typical job sequence. Most important, the sequenced competencies can help students avoid attempting skills for which they are not ready because they lack the preceding skills in a chain of competencies.

3. Whether the vocational-technical program can presently teach every one of the competencies on the competency list is beside the point. When the school conducts an occupational analysis, it is analyzing the occupation, not the instructional program. The competency list, then, should include every one of the tasks identified as needed by the beginning worker in that level of the occupation.

   How, where, and by whom the competencies are going to be taught is another matter, which should be dealt with separately. The school can't expect to run their present program efficiently or plan for the future improvement of the program if they don't use the entire list of entry-level occupational tasks.

Having all those competencies on the list—whether they are included in the present instructional program or not—can have some powerful advantages as well. Students can readily see where they may need additional on-the-job training. Teachers and administrators can see where the program needs improvement. And business and industry will clearly understand which competencies, included in the instructional program, require field experiences.

The complete list can thus be used to document the need for additional resources. It may be used to secure the needed materials and equipment from the education budget or to encourage donations or other assistance from businesses and industries in the field.

A well-prepared and **complete** competency list is important if the school is to be honest with itself, honest with its students, and honest with the occupation for which it is training workers.

Level of Performance: Your written responses to the self-check items should have covered the same **major** points as the model answers. If you missed some points or have questions about any additional points you made, review the material in the information sheet, Organizing the Task List, pp. 42–45, or check with your resource person if necessary.

Learning Experience III

OVERVIEW

After acquiring a task list for your occupational area, verify one duty area and organize the tasks for effective teaching and learning.

You will be locating a task list for an occupation in your own service area, selecting a single duty area, and organizing the tasks in that duty area for instructional purposes, using the Instructional Content Worksheet, pp. 51–52, to guide your efforts.

Your competency in verifying one duty area and organizing the tasks for effective teaching and learning will be evaluated by your resource person, using the Instructional Content Checklist, p. 53.

NOTES

This activity is designed to give you experience in the entire process of organizing the content for a CBE program. The activity, however, is limited in scope so that you will be dealing with only one duty area on a competency list, rather than with the complete list of competencies to be included in the vocational-technical program. Read the directions carefully and then complete each of the six exercises.

INSTRUCTIONAL CONTENT WORKSHEET

Directions: Before you start this activity, review **all** six items below to determine what you must do. Then complete each of the exercises as specified. Each item requires a **written** response. Please respond fully, but briefly, and make sure you respond to all parts of each item. Use additional paper if necessary.

1. Obtain a task list developed for an occupation in your specific area (or for a closely related occupation). Try to find a list (a) that is from a recognized source and (b) about which you can get some information concerning how it was developed. Describe how you located and selected the list.

2. Describe and critique the method originally used to identify the tasks on the list. Respond, if possible, to all the following questions:

   a. Who developed the task list? When? Where?

   b. What procedures were used in identifying the tasks? Who participated?

   c. Critique the method used. Was it a defensible and valid method? What were its strengths and/or weaknesses?

3. Select from the task list one duty area (general area of competency). Try to select a duty area that includes 10–20 tasks. Describe how you selected the duty area.

4. Locate at least one incumbent worker in the occupation—someone you can interview about the task list. Ask each worker to examine each of the tasks in the duty area selected and to verify the task as follows. Record each worker's responses on a copy of the task list.

   a. Does he/she actually perform this task?

   b. How important is the task? How often does he/she perform it?

   c. Is the task statement accurate? Should it be worded differently? If so, how should it be worded?

   d. Does he/she perform any other tasks in the duty area that should be on the list? If so, what are those tasks, and how should they be stated?

5. Review all the task statements in the category, including any you may have added. Rewrite any statements that do not meet the recommended guidelines for well-composed task statements. Show how you improved the statements by attaching to this worksheet both the original and the revised versions.

6. On the revised list, number the statements (now competency statements) to indicate the order in which you would sequence the competencies for purposes of instruction. Explain your rationale for sequencing the competencies as you did.

After you have completed the worksheet, arrange to have your resource person review and evaluate the results. Give him/her the Instructional Content Checklist, p. 53, to use in evaluating your work.

INSTRUCTIONAL CONTENT CHECKLIST

Directions: Place an X in the NO, PARTIAL, or FULL box to indicate that each of the following performance competencies was not accomplished, partially accomplished, or fully accomplished. If, because of special circumstances, a performance component was not applicable, or impossible to execute, place an X in the N/A box.

Name _____

Date _____

Resource Person _____

LEVEL OF PERFORMANCE

	N/A	No	Partial	Full
In organizing the instructional content for a CBE program, the teacher:				
1. obtained an appropriate task list for his/her occupational area . .	☐	☐	☐	
2. identified and critiqued the method used to develop the occupational task list	☐	☐	☐	
3. selected an appropriate duty area to be verified and organized .	☐	☐	☐	
The occupational task list selected by the teacher was:				
4. verified by one or more qualified incumbent workers in the occupation	☐	☐	☐	
5. revised in the light of information received in the verification process	☐	☐	☐	
6. stated in terms that meet accepted standards for task statements	☐	☐	☐	
7. sequenced in a logical order for instructional purposes	☐	☐	☐	
The final document presented by the teacher:				
8. included descriptions of steps taken in the content organization process	☐	☐	☐	
9. presented a valid rationale for each decision made in the content organization process	☐	☐	☐	
10. was well organized, clearly stated, and neatly presented	☐	☐	☐	

Level of Performance: All items must receive FULL or N/A responses. If any items receives a NO or PARTIAL response, the teacher and resource person should meet to determine what additional activities the teacher needs to complete in order to reach competency in the weak area(s).

Learning Experience IV

FINAL EXPERIENCE

In an **actual teaching situation,*** organize the content for a CBE program.

As part of your teaching duties, organize the content for a CBE program. This will include—

- obtaining an existing task list or producing a task list through an accepted occupational analysis process
- refining the task statements
- verifying the tasks locally, if necessary
- clustering and sequencing the competencies for instructional purposes
- specifying occupational entry and exit points

NOTE: As you complete each of the above activities, document your actions (in writing, on tape, through a log) for assessment purposes.

Arrange to have your resource person review the documentation you have compiled.

Your total competency will be assessed by your resource person, using the Teacher Performance Assessment Form, pp. 57–58.

Based upon the criteria specified in this assessment instrument, your resource person will determine whether you are competent in organizing the content for a CBE program.

* For a definition of "actual teaching situation," see the inside back cover.

TEACHER PERFORMANCE ASSESSMENT FORM

Organize the Content for a CBE Program (K-2)

Name _____

Date _____

Resource Person _____

Directions: Indicate the level of the teacher's accomplishment by placing an X in the appropriate box under the LEVEL OF PERFORMANCE heading. If, because of special circumstances, a performance component was not applicable, or impossible to execute, place an X in the N/A box.

	LEVEL OF PERFORMANCE					
	N/A	None	Poor	Fair	Good	Excellent
The occupational task list on which the teacher based his/her program:						
1. derived from an accepted occupational analysis process	☐	☐	☐	☐	☐	☐
2. was on target (e.g., geared to carefully defined occupations, levels, and settings)	☐	☐	☐	☐	☐	☐
3. was up-to-date	☐	☐	☐	☐	☐	☐
4. was complete	☐	☐	☐	☐	☐	☐
5. was locally verified by an advisory committee or committee of incumbent workers, if necessary	☐	☐	☐	☐	☐	☐
The refined task statements:						
6. were as clearly stated as possible	☐	☐	☐	☐	☐	☐
7. each started with a verb describing an observable action	☐	☐	☐	☐	☐	☐
8. met all the requirements for good statements	☐	☐	☐	☐	☐	☐
9. were worded in a consistent and parallel manner	☐	☐	☐	☐	☐	☐
The verification process:						
10. involved expert workers or their supervisors	☐	☐	☐	☐	☐	☐
11. was conducted in a structured manner	☐	☐	☐	☐	☐	☐
The verification data:						
12. were accurately tabulated and interpreted	☐	☐	☐	☐	☐	☐
13. were used to modify the task list as needed	☐	☐	☐	☐	☐	☐
The competencies on the final list:						
14. were clustered to accomplish the following:						
a. to emphasize logical relationships	☐	☐	☐	☐	☐	☐
b. to minimize repetition and overlap	☐	☐	☐	☐	☐	☐
c. to maximize learning effectiveness	☐	☐	☐	☐	☐	☐
d. to maximize instructional efficiency	☐	☐	☐	☐	☐	☐

	N/A	None	Poor	Fair	Good	Excellent
e. to make the most productive use of facilities and equipment	☐	☐	☐	☐	☐	☐
f. to group together minor related competencies	☐	☐	☐	☐	☐	☐
15. were sequenced in a logical order to promote effective learning and maintain student interest	☐	☐	☐	☐	☐	☐
16. were organized in list or chart form to indicate: a. competencies required for the total occupation	☐	☐	☐	☐	☐	☐
b. specific competencies required for suboccupations	☐	☐	☐	☐	☐	☐
c. program entry and exit points	☐	☐	☐	☐	☐	☐

Level of Performance: All items must receive N/A, GOOD, or EXCELLENT responses. If any item receives a NONE, POOR, or FAIR response, the teacher and resource person should meet to determine what additional activities the teacher needs to complete in order to reach competency in the weak area(s).

ABOUT USING THE NATIONAL CENTER'S PBTE MODULES

Organization

Each module is designed to help you gain competency in a particular skill area considered important to teaching success. A module is made up of a series of learning experiences, some providing background information, some providing practice experiences, and others combining these two functions. Completing these experiences should **enable** you to achieve the **terminal** objective in the final learning experience. The final experience in each module always requires you to demonstrate the skill in an actual teaching situation when you are an intern, a student teacher, an inservice teacher, or occupational trainer.

Procedures

Modules are designed to allow you to individualize your teacher education program. You need to take only those modules covering skills that you do not already possess. Similarly, you need not complete any learning experience within a module if you already have the skill needed to complete it. Therefore, before taking any module, you should carefully review (1) the introduction, (2) the objectives listed on p. 4, (3) the overviews preceding each learning experience, and (4) the final experience. After comparing your present needs and competencies with the information you have read in these sections, you should be ready to make one of the following decisions:

- That you do not have the competencies indicated and should complete the entire module
- That you are competent in one or more of the enabling objectives leading to the final learning experience and, thus, can omit those learning experiences
- That you are already competent in this area and are ready to complete the final learning experience in order to "test out"
- That the module is inappropriate to your needs at this time

When you are ready to complete the final learning experience **and** have access to an actual teaching situation, make the necessary arrangements with your resource person. If you do not complete the final experience successfully, meet with your resource person and arrange to (1) repeat the experience or (2) complete (or review) previous sections of the module or other related activities suggested by your resource person before attempting to repeat the final experience.

Options for recycling are also available in each of the learning experiences preceding the final experience. Any time you do not meet the minimum level of performance required to meet an objective, you and your resource person may meet to select activities to help you reach competency. This could involve (1) completing parts of the module previously skipped, (2) repeating activities, (3) reading supplementary resources or completing additional activities suggested by the resource person, (4) designing your own learning experience, or (5) completing some other activity suggested by you or your resource person.

Terminology

Actual Teaching Situation: A situation in which you are actually working with and responsible for teaching secondary or postsecondary vocational students or other occupational trainees. An intern, a student teacher, an inservice teacher, or other occupational trainer would be functioning in an actual teaching situation. If you do **not** have access to an actual teaching situation when you are taking the module, you can complete the module **up to** the final learning experience. You would then complete the final learning experience later (i.e., when you have access to an actual teaching situation).

Alternate Activity or Feedback: An item that may **substitute** for required items that, due to special circumstances, you are unable to complete.

Occupational Specialty: A specific area of preparation within a vocational service area (e.g., the service area Trade and Industrial Education includes occupational specialties such as automobile mechanics, welding, and electricity.

Optional Activity or Feedback: An item that is not required but that is designed to **supplement** and enrich the required items in a learning experience.

Resource Person: The person in charge of your educational program (e.g., the professor, instructor, administrator, instructional supervisor, cooperating/supervising/classroom teacher, or training supervisor who is guiding you in completing this module).

Student: The person who is receiving occupational instruction in a secondary, postsecondary, or other training program.

Vocational Service Area: A major vocational field: agricultural education, business and office education, marketing and distributive education, health occupations education, home economics education, industrial arts education, technical education, or trade and industrial education.

You or the Teacher/Instructor: The person who is completing the module.

Levels of Performance for Final Assessment

N/A: The criterion was not met because it was **not applicable** to the situation.

None: No attempt was made to meet the criterion, although it was relevant.

Poor: The teacher is unable to perform this skill or has only **very limited ability** to perform it.

Fair: The teacher is unable to perform this skill in an acceptable manner but has **some ability** to perform it.

Good: The teacher is able to perform this skill in an **effective** manner.

Excellent: The teacher is able to perform this skill in a **very effective** manner.

Titles of the National Center's Performance-Based Teacher Education Modules

Category A: Program Planning, Development, and Evaluation

- A-1 Prepare for a Community Survey
- A-2 Conduct a Community Survey
- A-3 Report the Findings of a Community Survey
- A-4 Organize an Occupational Advisory Committee
- A-5 Maintain an Occupational Advisory Committee
- A-6 Develop Program Goals and Objectives
- A-7 Conduct an Occupational Analysis
- A-8 Develop a Course of Study
- A-9 Develop Long-Range Program Plans
- A-10 Conduct a Student Follow-Up Study
- A-11 Evaluate Your Vocational Program

Category B: Instructional Planning

- B-1 Determine Needs and Interests of Students
- B-2 Develop Student Performance Objectives
- B-3 Develop a Unit of Instruction
- B-4 Develop a Lesson Plan
- B-5 Select Student Instructional Materials
- B-6 Prepare Teacher-Made Instructional Materials

Category C: Instructional Execution

- C-1 Direct Field Trips
- C-2 Conduct Group Discussions, Panel Discussions, and Symposiums
- C-3 Employ Brainstorming, Buzz Group, and Question Box Techniques
- C-4 Direct Students in Instructing Other Students
- C-5 Employ Simulation Techniques
- C-6 Guide Student Study
- C-7 Direct Student Laboratory Experience
- C-8 Direct Students in Applying Problem-Solving Techniques
- C-9 Employ the Project Method
- C-10 Introduce a Lesson
- C-11 Summarize a Lesson
- C-12 Employ Oral Questioning Techniques
- C-13 Employ Reinforcement Techniques
- C-14 Provide Instruction for Slower and More Capable Learners
- C-15 Present an Illustrated Talk
- C-16 Demonstrate a Manipulative Skill
- C-17 Demonstrate a Concept or Principle
- C-18 Individualize Instruction
- C-19 Employ the Team Teaching Approach
- C-20 Use Subject Matter Experts to Present Information
- C-21 Prepare Bulletin Boards and Exhibits
- C-22 Present Information with Models, Real Objects, and Flannel Boards
- C-23 Present Information with Overhead and Opaque Materials
- C-24 Present Information with Filmstrips and Slides
- C-25 Present Information with Films
- C-26 Present Information with Audio Recordings
- C-27 Present Information with Televised and Videotaped Materials
- C-28 Employ Programmed Instruction
- C-29 Present Information with the Chalkboard and Flip Chart
- C-30 Provide for Students' Learning Styles

Category D: Instructional Evaluation

- D-1 Establish Student Performance Criteria
- D-2 Assess Student Performance: Knowledge
- D-3 Assess Student Performance: Attitudes
- D-4 Assess Student Performance: Skills
- D-5 Determine Student Grades
- D-6 Evaluate Your Instructional Effectiveness

Category E: Instructional Management

- E-1 Project Instructional Resource Needs
- E-2 Manage Your Budgeting and Reporting Responsibilities
- E-3 Arrange for Improvement of Your Vocational Facilities
- E-4 Maintain a Filing System
- E-5 Provide for Student Safety
- E-6 Provide for the First Aid Needs of Students
- E-7 Assist Students in Developing Self-Discipline
- E-8 Organize the Vocational Laboratory
- E-9 Manage the Vocational Laboratory
- E-10 Combat Problems of Student Chemical Use

Category F: Guidance

- F-1 Gather Student Data Using Formal Data-Collection Techniques
- F-2 Gather Student Data Through Personal Contacts
- F-3 Use Conferences to Help Meet Student Needs
- F-4 Provide Information on Educational and Career Opportunities
- F-5 Assist Students in Applying for Employment or Further Education

Category G: School–Community Relations

- G-1 Develop a School–Community Relations Plan for Your Vocational Program
- G-2 Give Presentations to Promote Your Vocational Program
- G-3 Develop Brochures to Promote Your Vocational Program
- G-4 Prepare Displays to Promote Your Vocational Program
- G-5 Prepare News Releases and Articles Concerning Your Vocational Program
- G-6 Arrange for Television and Radio Presentations Concerning Your Vocational Program
- G-7 Conduct an Open House
- G-8 Work with Members of the Community
- G-9 Work with State and Local Educators
- G-10 Obtain Feedback about Your Vocational Program

Category H: Vocational Student Organization

- H-1 Develop a Personal Philosophy Concerning Vocational Student Organizations
- H-2 Establish a Vocational Student Organization
- H-3 Prepare Vocational Student Organization Members for Leadership Roles
- H-4 Assist Vocational Student Organization Members in Developing and Financing a Yearly Program of Activities
- H-5 Supervise Activities of the Vocational Student Organization
- H-6 Guide Participation in Vocational Student Organization Contests

Category I: Professional Role and Development

- I-1 Keep Up to Date Professionally
- I-2 Serve Your Teaching Profession
- I-3 Develop an Active Personal Philosophy of Education
- I-4 Serve the School and Community
- I-5 Obtain a Suitable Teaching Position
- I-6 Provide Laboratory Experiences for Prospective Teachers
- I-7 Plan the Student Teaching Experience
- I-8 Supervise Student Teachers

Category J: Coordination of Cooperative Education

- J-1 Establish Guidelines for Your Cooperative Vocational Program
- J-2 Manage the Attendance, Transfers, and Terminations of Co-Op Students
- J-3 Enroll Students in Your Co-Op Program
- J-4 Secure Training Stations for Your Co-Op Program
- J-5 Place Co-Op Students on the Job
- J-6 Develop the Training Ability of On-the-Job Instructors
- J-7 Coordinate On-the-Job Instruction
- J-8 Evaluate Co-Op Students' On-the-Job Performance
- J-9 Prepare for Students' Related Instruction
- J-10 Supervise an Employer–Employee Appreciation Event

Category K: Implementing Competency-Based Education (CBE)

- K-1 Prepare Yourself for CBE
- K-2 Organize the Content for a CBE Program
- K-3 Organize Your Class and Lab to Install CBE
- K-4 Provide Instructional Materials for CBE
- K-5 Manage the Daily Routines of Your CBE Program
- K-6 Guide Your Students Through the CBE Program

Category L: Serving Students with Special/Exceptional Needs

- L-1 Prepare Yourself to Serve Exceptional Students
- L-2 Identify and Diagnose Exceptional Students
- L-3 Plan Instruction for Exceptional Students
- L-4 Provide Appropriate Instructional Materials for Exceptional Students
- L-5 Modify the Learning Environment for Exceptional Students
- L-6 Promote Peer Acceptance of Exceptional Students
- L-7 Use Instructional Techniques to Meet the Needs of Exceptional Students
- L-8 Improve Your Communication Skills
- L-9 Assess the Progress of Exceptional Students
- L-10 Counsel Exceptional Students with Personal–Social Problems
- L-11 Assist Exceptional Students in Developing Career Planning Skills
- L-12 Prepare Exceptional Students for Employability
- L-13 Promote Your Vocational Program with Exceptional Students

Category M: Assisting Students in Improving Their Basic Skills

- M-1 Assist Students in Achieving Basic Reading Skills
- M-2 Assist Students in Developing Technical Reading Skills
- M-3 Assist Students in Improving Their Writing Skills
- M-4 Assist Students in Improving Their Oral Communication Skills
- M-5 Assist Students in Improving Their Math Skills
- M-6 Assist Students in Improving Their Survival Skills

RELATED PUBLICATIONS

Student Guide to Using Performance-Based Teacher Education Materials
Resource Person Guide to Using Performance-Based Teacher Education Materials
Guide to the Implementation of Performance-Based Teacher Education
Performance-Based Teacher Education: The State of the Art, General Education and Vocational Education

For information regarding availability and prices of these materials contact—AAVIM, American Association for Vocational Instructional Materials, 120 Driftmier Engineering Center, University of Georgia, Athens, Georgia 30602, (404) 542-2586

ISBN0–89606–186–8